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ABSTRACT

This proceedings document is comprised of the 18 papers, panel presentations, and work shares presented at a 1996 conference on institutional research. The papers are: (1) "Using Cohort Analysis To Evaluate the Impact of a Support Program for Minority Students" (Hershel Alexander); (2) "The Institutional Researcher as Program Evaluator: Influencing the Development of Innovative Programs" (Anne Marie Delaney); (3) "What Price a Nittany Lion? Tuition and Fees at Penn State from 1859 to 1996" (Michael J. Dorris and O. Richard Bundy, III); (4) "Who Does the Community College Serve? One College's Experience" (Eleanor Fujita); (5) "Glass Ceilings and Sticky Floors at SUNY: Is There Gender/Race Bias in Academic Rank?" (L. Haignere and B. Eisenberg); (6) "Working with the NRC Data on Graduate Programs in the U.S.: Considerations and Concerns" (Robert J. Heffernan, Paul Snyder, Tina Grycenkov Paladinom, and Marie Paulette Matis); (7) "Developing a Profile of Retained and Attrited Students" (Tracy A. Hunt-White); (8) "Graduation Rates at the University of New Hampshire: An Historical Perspective-Morality in Retrospect" (John Kraus and Antonietta Taylor); (9) "A Sector-Wide Survey of Faculty in Private Higher Education: One State's Thoughts on the Nature of Faculty Work and Reward Systems" (Michael McGuire and Jason Casey); (10) "Placement Test Scores and Student Persistence: Institutional Considerations for Ability to Benefit" (Alan J. Sturtz); (11) "In Search of Peer Institutions: Two Methods of Exploring and Determining Peer Institutions' (Bruce P. Szelest); (12) "Weaving Institutional Research into the Fabric of TQM" (Dawn Geronimo Terkla and Kelli J. Armstrong); (13) "IR Influence on Marketing and Pricing Policies: First Time Graduate Student Inquiries Why Don't They Apply?" (Stephen W. Thorpe); (14) "What Do the NRC Graduate Program Ratings Measure?" (Robert K. Toutkoushian, Halil Dundar, and William E. Becker); (15) "Administrative Satisfaction and the Regulatory Climate at Public Universities" (James Fredericks Volkwein, Shaukat M. Malik, and Michelle Napierski-Prancl); (16) "A Study of Institutional Autonomy in the Community College and Its Relationship to Administrative Judgements of Institutional Effectiveness" (Anita C. Voogt);(17) "Developing a Postsecondary Education Taxonomy for Inter-Institutional Graduation Rate Comparisons" (Timothy A. Walsh); and (18) "Increasing the Utility of the College Board Standard Validity Study: An MS-DOS Qbasic Program for Predicting an Applicant's College Performance"

+++++ ED432186 Has Multi-page SFR---Level=1 +++++
(Jishen Zhao). Also included are the conference program and the 1996 membership list. (Some papers contain references.) (DB)

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North East Association for Institutional Research

23rd Annual Conference

Proceedings

NEAIR

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Thoughts of One's Own: Innovative Leadership in Institutional Research

Nassau Inn • Princeton, New Jersey
November 16-19, 1996

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TO THE EDUCATIONAL RESOURCES INFORMATION CENTER (ERIC)

Dear Friends and Colleagues,

This volume contains almost all of the presentations given at what was an outstanding 23rd Annual Conference of the Northeast Association for Institutional Research, held in Princeton, New Jersey. Attendance was high, the weather good, the location ideal, and best of all, the quality of the sessions was consistently high. I especially recommend to you the paper by Robert Toutkoushian which won the Best Paper Award for this conference. It is unfortunate that other highly regarded elements of the conference, such as the Newcomers Workshop, the two Statistics Workshops, the Web Basics Workshop, and the final panel presentation, cannot also be included here.

The list of people deserving thanks for the success of the conference is about as long as the list of attendees. Barbara Palmer deserves an award for the Best Program Put Together By A Person Who Had No Chips to Call In; Eleanor Swanson for Outstanding Local Arrangements Organization by a Self-Styled Disorganized Person; and, as usual, Brenda Bretz wins both the Congeniality and Talent awards, as well as the running-suit competition. I would also like to thank Corby Coperthwaite (Publications Chair), Marian Pagano (Mentor program), Marge Wiseman (conference evaluation), Denise Krallman (1997Program Chair), Bob Yanckello (1997 Local Arrangements Chair), and Sandy Johnson, Tony Broh, and other NJAIR members for their help. Finally, of course, all of us who worked on the Princeton conference for more than a year must express our appreciation to all of you who sent in proposals, made your presentations, and served as both appreciative and critical audiences. Despite all the hard work of those named above, there would have been no conference at all without you.

The Proceedings that you are holding, by the way, may soon become a collectors item: Jennifer Brown, 1996-97 NEAIR President, has formed a committee to investigate the development of an NEAIR Website, which might eventually include our conference Proceedings, although hard copies would be available on request. Stay tuned for further developments!

I wish you the best of health, wealth, and enrollments for 1997, and look forward to seeing you in Hartford.

Ellen A. Kanarek
President, NEAIR 1995-96

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[1]*Robert K. Toutkoushian's paper was selected for the Best Paper Award

USING COHORT ANALYSIS TO EVALUATE THE IMPACT OF A SUPPORT PROGRAM FOR MINORITY STUDENTS

Hershel Alexander
Research and Planning Analyst
Prince George's Community College

Introduction

Over the years, Prince George's Community College has demonstrated commitment to its growing proportion of minority students by tracking minority student progress and by establishing support programs. This paper illustrates how the college's Office of Institutional Research and Analysis evaluated one of these programs. Following an overview of the methodology and preceding a summary of the report, findings from this program evaluation are highlighted in 5 areas: Developmental Needs and Course Loads; Retention Rates; Cumulative Credit Hours; Average GPAs; and the Prince George's outcomes typology.

The research office's experience with college-wide cohort studies facilitated the acceptance of its first application of a cohort methodology to a program evaluation. But to which program? Since minority students had increased to about 3 quarters of all first-time freshmen and since these minority students had been achieving at lower levels than other first-time freshmen, the college decided upon the only support program for minority students exclusively: ALANA, a program for African, Latin, Asian, and Native American students that offered services such as college orientation sessions, cultural field trips, faculty or staff mentors, motivational/informational newsletters, social receptions, and referrals to other areas for additional assistance. Originally, ALANA had been open to any minority student. Starting in fall 1992, though, ALANA targeted only minority students with 2 or 3 developmental needs (English, mathematics, or reading). Over the years, non-targeted minority students who had applied on their own initiative were accepted as well.

Methodology

In each fall cohort of first-time freshmen, minority students in ALANA during the initial fall term were compared to all other minority students. Of the 1,059 ALANA students at the college from fall 1991 through fall 1994, only those students who were fall first-time freshmen were included in the analysis. Because prior college-wide cohort studies had shown developmental needs and course loads to be among the best predictors of achievement, students were matched on these two variables. Although motivation had been raised as an alternative hypothesis to any ALANA impact, it is noteworthy that students might express motivation by

participating in this voluntary support program. ALANA provided participant social security numbers. Other data came from the college's end-of-semester files and from the Maryland Higher Education Commission's Transfer Student System. All data reflected cohort populations, so inferential statistics were not used.

Developmental Needs and Course Loads

There was more variation among ALANA students than among other minority students with respect to the percent of students with 2 or 3 developmental needs (as assessed by the college's testing office prior to course registration). Depending on the fall cohort, the rate of 2 or 3 developmental needs was as high as 83 percent and as low as 43 percent among ALANA students and as high as 43 percent and as low as 35 percent among other minority students. In addition, the fraction of full-time students fluctuated more among ALANA students than among other minority students, with ALANA proportions ranging from 45 percent to 71 percent (versus 37 percent to 42 percent).

ALANA Students and Other Minority Students
Percent of Headcount by Initial Developmental Needs and Course Loads
Fall Cohorts 1991 through 1994

	91		92		93		94	
Initial Profile	A	O	A	O	A	O	A	O
No Need	32	36	4	36	15	36	21	34
1 Need	19	21	13	29	40	27	36	30
2 or 3 Needs	49	43	83	35	45	37	43	36
Full-time	61	37	63	38	45	42	71	40
Part-time	39	63	37	62	55	58	29	60
HEADCOUNT	207	1,520	94	1,684	20	1,61	14	1,64

Retention Rates

The overall retention rate in a given term or in some subsequent term was higher for ALANA students than for other minority students. Among minority students attending college for the first time in fall 1991, 70 percent of ALANA students versus 53 percent of other minority students returned in fall 1992 or in some

later term (up through spring 1995). From this fall 1991 cohort, 46 percent of ALANA students and 35 percent of other minority students were enrolled in fall 1993 or in some later term.

ALANA Students and Other Minority Students
Percent of Headcount in a Given Term or in Some Subsequent Term
Fall Cohorts 1991 through 1994

	91		92		93		94	
Term	A	O	A	O	A	O	A	O
Fall 1991	100	100						
Spring 1992	82	68						
Fall 1992	70	53	100	100				
Spring 1993	63	45	83	68				
Fall 1993	46	35	64	51	100	100		
Spring 1994	37	29	54	42	90	68		
Fall 1994	26	22	43	33	70	49	100	100
Spring 1995	19	15	29	24	60	37	86	62
HEADCOUNT	207	1,50	94	1,64	20	1,61	14	1,64

Even when students were matched by developmental needs or by course loads, the retention rate in a given term or in some subsequent term was almost always higher for ALANA students than for other minority students. These findings held across cohorts. For the sake of exposition, the tables on the following page contain findings from the fall 1991 cohort only (the author's manuscript in the bibliography presents findings from the other cohorts). In fall 1992, the retention rates for ALANA students were 75 percent (no developmental need), 74 percent (1 developmental need), and 65 percent (2 or 3 developmental needs). The respective retention rates by developmental needs for other minority students were 50 percent, 55 percent, and 54 percent. The fall 1992 retention rate was 77 percent for ALANA students with full-time course loads in fall 1991 and 59 percent for ALANA students with part-time course loads in fall 1991. The corresponding proportions for other minority students were 65 percent and 45 percent.

ALANA Students and Other Minority Students Percent of Headcount in a Given Term or in Some Subsequent Term Fall Cohort 1991 by Initial Developmental Needs						
	No Need		1 Need		2 or 3 Needs	
Term	ALANA	Other	ALANA	Other	ALANA	Other
Spring 1992	87	65	80	70	80	69
Fall 1992	75	50	74	55	65	54
Spring 1993	64	43	72	47	58	45
Fall 1993	51	33	51	39	41	35
Spring 1994	43	29	36	32	33	28
Fall 1994	27	21	23	25	27	21
Spring 1995	21	15	15	17	19	13
HEADCOUNT	67	552	39	321	101	647

ALANA Students and Other Minority Students Percent of Headcount in a Given Term or in Some Subsequent Term Fall Cohort 1991 by Initial Course Loads				
	Full-time		Part-time	
Term	ALANA	Other	ALANA	Other
Spring 1992	88	79	73	61
Fall 1992	77	65	59	45
Spring 1993	68	57	55	37
Fall 1993	46	42	46	31
Spring 1994	35	34	39	27
Fall 1994	24	23	29	21
Spring 1995	18	16	20	15
HEADCOUNT	127	566	80	954

Cumulative Credit Hours

At the end of spring 1995, the average credit hours earned by ALANA students was least as high as for other minority students from the same cohort. In the fall cohorts 1991 through 1994, ALANA students earned respective averages of 23 credit hours, 14 credit hours, 14 credit hours, and 9 credit hours. The figures for other minority students in these cohorts were 15 credit hours, 14 credit hours, 12 credit hours, and 7 credit hours.

Average Cumulative Credit Hours Earned through Spring 1995 Fall Cohorts 1991 through 1994		
Fall	ALANA	Other
1991	23	15
1992	14	14
1993	14	12
1994	9	7

Among students with developmental needs, ALANA students earned more credit hours (on average) than other minority students. For ALANA students with 2 or 3 developmental needs in the fall cohorts 1991 through 1994, earned credit hours averaged 15 credit hours, 12 credit hours, 13 credit hours, and 7 credit hours (compared to 11 credit hours, 10 credit hours, 7 credit hours, and 4 credit hours). This pattern of higher earned credit hours for ALANA students than for other minority students held for students with only 1 developmental need as well, but the pattern did not always hold for students with no developmental need.

Average Cumulative Credits Earned through Spring 1995 Fall Cohorts 1991 through 1994 by Initial Developmental Needs						
	No Need		1 Need		2 or 3 Needs	
Fall	ALANA	Other	ALANA	Other	ALANA	Other
1991	32	18	26	16	15	11
1992	31	18	21	15	12	10
1993	11	16	16	12	13	7
1994	9	10	9	8	7	4

Full-time and part-time ALANA students did not consistently achieve more than their respective counterparts. Full-time and part-time ALANA students in the fall 1991 cohort earned an average of 5 credit hours more than their comparison groups by spring 1995. Yet in the fall 1992 cohort, full-time ALANA students earned 18 credit hours, while other minority full-time students earned 22 credit hours. The respective numbers among part-time students from this cohort were 7 credit hours versus 10 credit hours.

Average Credits Earned through Spring 1995
Fall Cohorts 1991 through 1994 by Initial Course Loads

	Full-time		Part-time	
Fall	ALANA	Other	ALANA	Other
1991	27	22	16	11
1992	18	22	7	10
1993	15	17	13	7
1994	11	10	4	5

Average GPAs

In 3 of 4 fall cohorts, ALANA students had higher average GPAs than other minority students. For both sets of students, all average GPAs fell below 2.00 (the level required at the college for academic good standing). The highest average (a 1.88 GPA) was earned by ALANA students from the fall 1994 cohort.

Average GPA through Spring 1995
Fall Cohorts 1991 through 1994

Fall	ALANA	Other
1991	1.83	1.72
1992	1.43	1.70
1993	1.82	1.71
1994	1.88	1.64

ALANA students with 2 or 3 developmental needs had higher average GPAs than other minority students with 2 or 3 such needs. For the fall cohorts 1991 through 1994, the average ALANA GPAs were 1.57, 1.32, 1.73, and 2.39 (compared to 1.30, 1.30, 1.18, and 1.06 for the average non-ALANA GPAs). At other levels of developmental need, this pattern in favor of ALANA did not always hold across cohorts.

Average GPA through Spring 1995
Fall Cohorts 1991 through 1994 by Initial Developmental Needs

	No Need		1 Need		2 or 3 Needs	
Fall	ALANA	Other	ALANA	Other	ALANA	Other
1991	2.10	2.16	2.03	1.83	1.57	1.30
1992	2.21	2.00	1.86	1.83	1.32	1.30
1993	2.37	2.12	1.71	1.88	1.73	1.18
1994	1.49	2.13	1.50	1.80	2.39	1.06

ALANA was not necessarily associated with the higher GPAs among full and part-time students. Although full-time and part-time ALANA students from the fall 1991 cohort earned typically higher grades than their non-ALANA counterparts, this finding did appear with the other cohorts. Full-time and part-time students from the fall 1992 cohort posted generally lower marks if they were ALANA participants than if they were not ALANA participants (with full-time averages of a 1.48 GPA versus a 1.66 GPA and with part-time averages of a 1.35 GPA versus a 1.73 GPA).

Average GPA through Spring 1995
Fall Cohorts 1991 through 1994 by Initial Course Loads

	Full-time		Part-time	
Fall	ALANA	Other	ALANA	Other
1991	1.71	1.57	2.03	1.81
1992	1.48	1.66	1.35	1.73
1993	1.50	1.66	2.08	1.74
1994	2.10	1.56	1.33	1.70

Prince George's Community College Outcomes Typology

Four years after entry to Prince George's Community College, were there differences between ALANA students and other minority students with regards to award, transfer, and academic progress outcomes? Based on the community college outcomes typology that has been developed at Prince George's Community College, the answer is "yes." This typology has been promoted for use with cohorts having of minimum of four years of data and for use with regular motive students. Given these considerations, the table on the following page contains findings from the fall 1991 cohort only. In addition, the table includes just those students from the cohort who had indicated award goals on the college application or who had attended at some point beyond the second term.

Desirable outcome measures were higher for ALANA students than for other minority students. Eighteen percent of ALANA students earned an award or transferred, compared to 10 percent of other minority students. At 13 percent, the transfer-only rate for the ALANA group was more than twice the transfer-only rate for the comparison group (at 6 percent). Among students with no awards or transfers, ALANA students were more likely than their counterparts to be sophomores in good standing (to have earned 30 or more credit hours with a 2.00 GPA or higher): The respective rates were 16 percent versus 11 percent. Similar proportions of both groups enrolled in spring 1995 (8 percent and 10 percent), albeit without sophomore good standing. Students without sophomore good standing who were not enrolled at the college in spring 1995 accounted for 58 percent of ALANA students and for 70 percent of other minority students. From the perspective of the outcomes typology, only this last outcome measure constitutes non-achieving students.

Even when matching students on developmental needs and on course loads, the desirable outcome measures remained higher for ALANA students than for other minority students. A brief description of these outcome measures follows (the author's manuscript in the bibliography presents the tabular data): Among individuals with no developmental need, 31 percent of ALANA students and 16 percent of other minority students received an award and/or transferred. Among individuals with 1 developmental need, the corresponding proportions were 24 percent versus 9 percent, while these proportions were 7 percent versus about 6 percent among individuals with 2 or 3 developmental needs. Across all three levels of developmental need, a smaller percent of ALANA students than of other minority students fell into the college's definition of non-achievers (48 percent compared to 61 percent of individuals with no developmental needs, 51 percent compared to 68 percent of individuals with 1 developmental need, and 68 percent compared to 77 percent of individuals with 2 or 3 developmental needs). Twenty-three percent of the full-time students and 10 percent of the part-time students in ALANA received an award and/or transferred,

with respective figures of 18 percent and of about 5 percent for other minority students. While 54 percent of full-time students and 65 percent of part-time students in ALANA met the college's definition of non-achievers, these fractions were 63 percent and 75 percent of other minority students.

Outcome Measures of Regular Motive Students through Spring 1995 Fall 1991 Cohort				
Outcome Measures	Number		Percent	
	ALANA	Other	ALANA	Other
Awards or Transfers				
Award and Transfer	4	11	2	1
Transfer only	25	79	13	6
Award only	6	35	3	3
No Awards or Transfers				
Earned Sophomore Status with 2.00+ GPA	30	138	16	11
Did Not Earn Sophomore Status with 2.00+ GPA, but Enrolled Spring 1995	15	121	8	10
Did Not Earn Sophomore Status with 2.00+ GPA and Did Not Enroll Spring 1995	111	881	58	70
TOTAL	191	1,265	100	100

Summary

Over the years, Prince George's Community College has demonstrated commitment to its growing proportion of minority students by tracking minority student progress and by establishing support programs. This paper illustrated how the college's Office of Institutional Research and Analysis evaluated one of these programs through the use of a cohort analysis.

But which program? Since minority students had increased to about 3 quarters of all first-time freshmen and since these minority students had been achieving at lower levels than other first-time freshmen, the college decided upon the only support program for minority students exclusively: ALANA, a program for African, Latin, Asian, and Native American students. Originally, ALANA had targeted all minority students. Starting in fall 1992, though, ALANA targeted only minority students with 2 or 3 developmental needs (English, mathematics, or reading).

In each fall cohort of first-time freshmen, minority students in ALANA during the initial fall term were compared to all other minority students. Because prior college-wide cohort studies had shown developmental needs and course loads to be among the best predictors of achievement, students were matched on these two variables. Although motivation had been raised as an alternative hypothesis to any ALANA impact, it is noteworthy that students might express motivation by participating in this voluntary support program. In comparison to other minority students, spring 1995 outcomes indicated that minority students who had entered ALANA in their first semester:

* Had higher retention rates
* Earned at least as many credit hours
* Did not achieve consistently higher grade point averages
* Were more likely to earn awards or to transfer

Three of these four overall findings held even when matching students on initial developmental needs and on initial course loads: The overall finding for earned credit hours held only when matching students on initial developmental needs.

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The Institutional Researcher as Program Evaluator: Influencing the Development of Innovative Programs

Anne Marie Delaney
Director of Program Research
Boston College

Introduction

Purpose. The purpose of this paper is to present a model evaluation case study that illustrates how program evaluation can contribute effectively to the development of academic and professional degree programs; how qualitative and quantitative techniques can be employed to produce valid and reliable measures for evaluation studies; and how the role of the institutional researcher can be enhanced by assuming the role of program evaluator. Based on an evaluation of a university-based, interprofessional program, the paper presents design principles and methodological approaches relevant to the evaluation of a broad range of academic and professional degree programs.

Program Description. The program on which this evaluation study is based, the FIPSE InServ Project, was designed to better prepare teachers and other professionals to provide integrated services for at-risk children. Faculty and students from education, law, psychology, social work, nursing, management and arts and sciences collaborated to achieve the following objectives: to prepare future teachers to identify and address the complex educational, social, psychological, and health issues confronting today's children; to build interprofessional instructional teams in teacher preparation coursework and field supervision; and to establish interprofessional teams of students who will engage in field work/practicum experiences in schools.

Review of the Literature. The design of this evaluation incorporated principles and themes from models of program evaluation in general and writings on evaluation of integrated services in particular. Reflecting the influence of different models of program evaluation, the evaluation design included a focus on program objectives recommended by Tyler (1949); consideration of the program's context, input, process and product proposed by Stufflebeam (1983); attention to the stakeholder's perspective advocated by Stake (1990); and the inclusion of both formative and summative approaches at different stages of the evaluation (Scriven, 1967).

This evaluation was also designed to reflect the characteristics of the integrated services project being evaluated. Knapp (1995) recommends that evaluation of integrated services projects should reflect the unique and complex nature of these collaborative endeavors. Integrated services projects involve collaboration among numerous and diverse subjects. Evaluators must study the connections among the subjects which are often difficult to measure. Goetz (1993) proposes that the design

of the evaluation should reflect that integrated services is an ongoing process which requires continuous monitoring. Gomby and Larson (1992) concur, stating that integrated services is a comprehensive model and study of it should be long-term and concentrated..

Focusing on the complex nature of interprofessional collaboration, Levin and Greene (1994) assert that the nature of the collaborative endeavor implies a context of change, even chaos, resulting from changes in relationships, populations served, layers of organizations and management as well as changing mandates for professionals. To capture the complex, evolving nature of integrated services projects, evaluations should include diverse methodologies and incorporate both process and outcome components.

Outcome evaluations are recommended to be implemented later in the progression of the program, allowing the initial phase of the evaluation of a program to focus solely on process evaluation (Burt & Resnick, 1992). Knapp (1995) contends that attributing outcomes to the project requires an understanding of the process that produced the outcomes. Consistent with these recommendations, the evaluation of this program was designed to reflect and support the project's developmental phases moving from primarily a formative, qualitative approach in the first year to a more summative, quantitative approach in the third year.

Evaluation Methodology

Development of the Evaluation Plan. The evaluation methodology for this study was first outlined in the project proposal. This initial evaluation plan stated that evaluation activities would include monitoring progress, providing ongoing feedback for improvement, and assessing the impact of the project on all participants - student teachers, university faculty, classroom teachers, human service professionals and students in the classroom. Further, the evaluation would also be designed to examine the broader impact of the project by assessing the potential value of the project as a model for the reform of teacher education to represent a multi-professional approach to education. Once the project was funded, a more detailed evaluation plan was developed.

At the outset of the project, the project evaluator met with the project administrators and staff to request their cooperation in the evaluation; to delineate the information that would be required for the implementation analysis and to offer recommendations to facilitate the conduct of the evaluation. The four primary recommendations offered were: to form a task-oriented evaluation committee; to establish a system for documenting the project activities; to maintain a record of all curriculum development work; and to schedule periodic interviews with team members to elicit feedback on progress and problems in implementation. The unifying purpose of these recommendations was to create structures and systems that would support the progress of the project and the success of the evaluation. Of the four recommendations proposed, the second and third - regarding the need for documentation - were formally adopted by the project staff. The evaluation assistant conducted the proposed periodic interviews with project participants, and the intended

work for the evaluation committee was handled on an informal basis between the project and evaluation staff.

First Year Evaluation. Reflecting the project's orientation, the first year evaluation focused on the project's activities, strategies and documents designed to establish new intellectual and institutional foundations to support interprofessional collaboration. The nature of this phase of the project and of the evaluation was primarily process oriented. The three major components of the first year program evaluation included: an Implementation Analysis of the Project's Activities and Accomplishments; a Process Evaluation on Interprofessional Collaboration; and a Product Evaluation on the Development of an Integrated Teacher Education Curriculum.

The implementation analysis phase of the evaluation was conducted through interviews with various project participants; attendance at interprofessional events; and the collection and review of program materials, documentation, and meeting agenda. The following questions guided this phase of the evaluation: How did the project team translate the project goals into action? What activities and events did the project sponsor during the first year? and What was the impact of the project sponsored events?

The process evaluation was of paramount importance in this evaluation as it related to a fundamental requirement of the project; i.e., the ability of individuals from different professions and segments of the educational community to collaborate efficiently to integrate their knowledge and skills to achieve improved services for children. The following types of questions guided the process evaluation: What efforts were expended to create the interprofessional teams? What challenges were encountered in forming the teams? What strategies were employed to cope with the challenges? and What were the common and unique contributions offered by the members of the university and the school site teams? This phase of the evaluation was completed through observation, interviews, and reflection on the various collaborative experiences which occurred during the first year.

The product evaluation involved both an assessment of progress achieved in creating a draft curriculum development document and a review of the modified or newly created curriculum in terms of the degree to which they reflected the ongoing dialogue between the university and school interprofessional teams; the priorities and concerns articulated by these teams; the professional standards of teacher education; and the feasibility concerns of the faculty who would be involved in implementing the curricula.

Second Year Evaluation. The second year evaluation was intended to be both formative and summative. In addition to implementation, process and product evaluation components, the evaluation was expanded to include an outcome assessment of the perceived effects of project activities and events on current students. The specific outcomes addressed during the second year evaluation were the effects of this integrated services project on the perceptions, values and knowledge of current education students enrolled in the revised courses. Survey

questions were administered to current teacher education students to elicit their assessment of how well their teacher education program prepared them to achieve the following objectives related to the project goals:

- to design and use evaluative procedures appropriate for students in different age, gender, ethnic and cultural groups;
- to use relevant support systems within and outside the school in order to optimize opportunities for teaching and learning;
- to show respect for the unique developmental and cultural needs of special needs children, linguistic and other minorities;
- to deal effectively with complexity in the classroom resulting from multiple teacher roles and the academic, social and moral-ethical dimensions of the classroom; and
- to cope with diversity in terms of teaching students with different ability levels in the same class, from different socioeconomic backgrounds, from diverse racial/ethnic, cultural backgrounds, as well as students attending an inner-city school system.

The same survey questions had previously been administered to alumni/ae who graduated from the teacher education program prior to the inception of the FIPSE InServ Project. Using Chi-Square and t-test analyses, the responses of current students were compared with those of the alumni/ae.

During the second year of implementation, faculty members developed scenarios to be used in assessing the project's impact on current students. These scenarios are case studies illustrating the social-psychological problems that impact children's learning. Respondents are asked to identify the issues or problems reflected in the case; to propose strategies for addressing these issues; and to describe how they would collaborate with other professionals in serving these children. During the 1996 spring semester, the original scenarios and questions were administered to students to assess the nature of students' responses and to identify the strengths and weaknesses of the scenarios and evaluation criteria. Analysis of results from this administration provided a basis for revising the scenarios to increase their effectiveness as evaluation instruments.

The revised scenarios are being administered to students as a part of a pilot study during the first semester of the third year of the project. Based on results from this pilot study, the evaluator will conduct a reliability study and will recommend further revisions to ensure that these instruments meet acceptable reliability standards for use in the evaluation, specifically in assessing the impact of the FIPSE InServ Project on students' interprofessional knowledge and training. The development of valid and reliable assessment measures is crucial for the summative evaluation planned for the second semester of the third year of the FIPSE InServ Project.

First Year Evaluation Results

Implementation Analysis

The first year evaluation focused primarily on the project's implementation. This involved observing, recording and interpreting major events which included: an interprofessional academic retreat; an interprofessional campus lecture series; public lectures by distinguished speakers and urban seminars. A graduate student, serving as an evaluation assistant, assumed primary responsibility for this phase of the evaluation. When possible, she attended the event, or watched a videotape, summarized and interpreted the issues presented or discussed and noted the number of people participating in the event. Evaluation findings indicated that the interprofessional academic retreat and lecture series did provide an opportunity for various constituents to explore important themes in interprofessional collaboration and it did offer an opportunity for students, professors, and other faculty to become more aware of the needs of children. The evaluation report contained brief summaries of the project events as well as commentaries on how these events achieved the goals of the project.

Process Evaluation

As noted previously, a major goal of this project was to promote interprofessional collaboration. To achieve this goal, project administrators created interprofessional teams at the university and school sites. The process evaluation phase of this project included an assessment of the teams' progress; the identification of challenges encountered; and an analysis of the issues that emerged from the teams' collaborative efforts. Findings from this phase of the evaluation yielded insights relevant to the following aspects of interprofessional collaboration: intellectual issues, related to the development of an integrated curriculum; professional concerns, associated with the ability of individuals from different professions to cooperate effectively; and practical considerations, concerning the need to establish a convenient meeting site and to develop ongoing systems for efficient and timely communication.

Product Evaluation

Project participants identified four courses for revision: Child Development; Family, School and Society; Working with Special Needs Students; and Classroom Assessment. These courses were selected because they were required for undergraduate education students and they encompass fundamental knowledge, processes, and attitudes critical to future teachers. New teaching materials were identified, with a special emphasis on carefully constructed case studies that have implications for multiple professions.

In addition, project staff developed a new course, entitled "The Impact of Psychosocial Issues on Learning". This interdisciplinary course related to the goals of the FIPSE InServ Project in several ways. First, the course was designed to educate students from different professions on the importance of interprofessional collaboration. Second, the course focused on a variety of needs that children face, so participants in the class would become aware of children's educational, social,

psychological, and health needs, and they also would become aware of the importance of interprofessional collaboration for addressing these needs.

Recommendations

Based on findings from the previously described implementation, process and product evaluations, the first year evaluation report presented the following recommendations designed primarily to promote improvement and enhance the progress and impact of the project during the second and third year of implementation. The recommendations are organized according to three different areas of the project: interdisciplinary courses, interprofessional lecture series, and collaboration between the university and the schools. The rationale following each recommendation is based primarily on evaluation findings indicating need for improvement. These recommendations illustrate how negative findings from the evaluation were transformed into positive, constructive recommendations for improvement.

Interdisciplinary Courses.

1. Ensure that interdisciplinary courses reflect a balanced perspective. Interprofessional academic preparation is essential to the preparation of future professionals who plan to engage in interprofessional collaboration. Such courses need to reflect multiple disciplinary perspectives and students should be required to take these courses. To strengthen the collaborative experience, such courses might include a course project to be completed by students from different professional disciplines. This course related experience would potentially expand the interprofessional collaborative training opportunities for students and prepare them for their work at the school sites. Also students might develop case studies based on their interprofessional collaboration during their practicum.

2. Encourage faculty to integrate the lecture series with their courses. More students may attend the lectures if they are required as part of regular course activities. In this way students will become more aware of the need for and value of interprofessional collaboration. Results from recent alumni/ae research conducted at this institution support efforts to share the goals and ideas of this project with all students who are preparing to work with children, particularly in a school setting. Based on their own professional practice, our alumni/ae advocate intensive pre-professional preparation to enable newly practicing professionals to cope with the critical social-psychological challenges they will encounter in serving children at risk. This preparation can only be enhanced by attending the interprofessional lectures.

3. Offer an interdisciplinary seminar course on the case study method. Given the importance of case studies in interprofessional training, service and evaluation, it may be beneficial to offer a series of seminars or workshops on the case study method early in the second year of the project. Such a series might address both the intrinsic and instrumental value of the case study method for social work, education and program evaluation. Faculty, graduate students and other project participants would potentially benefit from such a seminar.

Interprofessional Lecture Series.

4. Increase the publicity about each lecture. If it has not already been done, explore various channels of communication in the university - including the faculty biweekly paper and the student newspaper. Publicizing the project would result in more professionals attending the lectures, and therefore, becoming more aware of the needs of children.

5. Consider holding some of the lectures, retreats, and workshops at the school sites.

6. Solicit evaluative data for ongoing program planning. A brief evaluation form might be distributed at each lecture. Participants might be asked: What was your goal in attending? To what extent was your goal achieved? and How has the presentation influenced your perspective on interprofessional collaboration?

Collaboration between the University and Schools.

7. During the second year, focus intensive efforts on parental and community involvement in the project. Since so much progress has been made already in achieving the goals of the University Collaboration Program, more time and resources might be expended in the second year on the Public School Services Program, particularly in attempting to increase parental and community involvement in the project.

8. Increase communication and establish strong relationships with representatives of community agencies. The FIPSE InServ Project team should intensify efforts to assure professionals in the community service agencies of the project's intent to support, not eliminate, their roles at the school site level. Proposed strategies include communicating more often with the agency directors; inviting staff to conferences and meetings; providing compensation for their involvement in the project; and strengthening efforts to establish a spirit of mutual trust and support.

Second Year Evaluation Results

As noted previously, the second year evaluation continued to serve a formative role, documenting the project's implementation and offering recommendations for program improvement. In addition, the evaluation was expanded to include an assessment of the project's impact on students enrolled in the new curricula. This assessment was based on comparative analyses of student survey results documenting the perceived effect of the FIPSE InServ Project on the preparation of current and former teacher education students as well as on analyses focusing only on current students' evaluation of how well the FIPSE InServ Project enabled them to achieve specific goals. Selected results from the comparative segment of the evaluation follow.

During the 1996 spring semester, a survey was administered to students enrolled in the four FIPSE related courses. FIPSE student responses were compared with those of 'non-FIPSE students', i.e., alumni/ae who were enrolled in teacher education

programs from 1987 through 1993, prior to the inception of the FIPSE InServ Project. The common questions, administered to both groups of students, related to how well the teacher preparation program prepared students to fulfill multiple teacher roles, to utilize relevant support systems, and to respond effectively to the unique and diverse needs of the students they teach.

As shown in Table 1, compared with the non-FIPSE students, the FIPSE students evaluated their teacher preparation program more positively in terms of preparing them to assume multiple teacher roles in order to cope with complexity in the classroom and deal with the academic, social and moral-ethical dimensions of the classroom. Some 36 percent of the FIPSE students, compared with only 22 percent of the non-FIPSE students, rated the program 'Very Well' on this objective. As indicated by the Chi-Square statistic, the difference between the FIPSE and non-FIPSE student ratings is statistically significant.

Table 1. FIPSE and Non-FIPSE Students' Evaluation of their Preparation to Serve Multiple Teacher Roles

Student Group	Poorly-Very Poorly	Fair	Well	Very Well	Total
FIPSE	1.5%	13.3%	48.9%	36.3%	100.0% (N=135)
Non-FIPSE	9.1	31.8	36.9	22.2	100.0% (N=320)

$X^2 = 30.94$ $p < .001$

FIPSE students also offered significantly more positive ratings in terms of the preparation offered for using relevant support systems, within and outside the school, in order to optimize opportunities for teaching and learning. Seventy-two percent of the FIPSE students, compared with 59 percent of the non-FIPSE students rated the program 'Well' or 'Very Well' in relation to this objective. The statistically significant results are presented in Table 2.

Table 2. FIPSE and Non-FIPSE Students' Evaluation of their Preparation to Use Relevant Support System

Student Group	Poorly-Very Poorly	Fair	Well	Very Well	Total
FIPSE	3.1%	24.8%	45.7%	26.4%	100.0% (N=129)
Non-FIPSE	9.2	31.9	39.6	19.3	100.0% (N=326)

$X^2 = 9.16$ $p < .05$

Another major goal of the FIPSE InServ Project was to prepare teachers to be sensitive and responsive to the unique needs of individual children and special student groups. Such sensitivity requires professional insight and the capacity to design instructional strategies and assessment procedures suitable for children in different groups. Evaluation results revealed that FIPSE students rated the program

significantly higher than did non-FIPSE students in terms of the preparation received to respect the unique needs of special needs and minority children (X^2=16.55 p ² .001). Some 54 percent of the FIPSE students, compared with 40 percent of the non-FIPSE students, rated the program very positively on this objective. Similarly, a significantly higher percent of the FIPSE students also rated the program positively with respect to the preparation received to design and use evaluative procedures appropriate for children in different groups (X^2=17.28 p² .001). Over 80 percent of the FIPSE students, compared with only 65 percent of the non-FIPSE students, rated the program 'Well' or 'Very Well' on this objective.

Maximizing students' potential for academic success, a primary goal of the FIPSE InServ Project, requires that teachers are prepared to cope with various aspects of diversity in the children they teach. Chi-Square results revealed the greatest perceived difference in the preparation for teaching students from diverse racial/ethnic and cultural backgrounds (X^2=59.23 p² .001). Approximately 80 percent of the FIPSE students, compared with only 47 percent of the non-FIPSE students, rated their teacher preparation program 'Well' or 'Very Well' on this objective. Results also showed that FIPSE students consistently rated their teacher preparation program significantly higher, than did non-FIPSE students, in terms of its effectiveness in preparing them to teach students with different ability levels (X^2=11.13 p² .05) and from different socioeconomic backgrounds (X^2=43.70 p² .001).

In addition to the individual item analysis, two scales were created to produce more reliable and succinct measures of perceived preparation for assuming multiple teacher roles and teaching diverse students. The first scale, Preparation for Multiple Teacher Roles is based on students' ratings of two items: preparation for dealing effectively with complexity from multiple teacher roles and preparation for using relevant support systems to optimize learning. The second scale, Preparation for Teaching Diverse Students included six items referring to the preparation to respond to children's unique and diverse characteristics in ability and socioeconomic, racial/ethnic and cultural background. The statistical properties of these scales are presented in Table 3. As shown, the reliability for the first, two-item scale is moderate, .68, and the reliability for the second, six-item scale is high, .88.

Table 3. Statistical Properties of the FIPSE InServ Project Evaluation Scales

Scales	Mean	S.D.	Reliability	No. of Items	Range of Responses Low - High
Preparation for Multiple Teacher Roles	3.81	.06	.68	2	1 - 5
Preparation for Teaching Diverse Students	3.75	.30	.88	6	1 - 5

Table 4 presents group mean ratings and the results of the t-test comparing FIPSE and non-FIPSE students' ratings on the scale, Preparation for Multiple Teacher Roles. As shown, the FIPSE mean rating is significantly higher than that of the non-FIPSE student rating.

Table 4. Comparison of Student Group Means on their Preparation for Multiple Teacher Roles

	FIPSE Students	Non-FIPSE Students	t Value
$\bar{X}$	4.07	3.70	5.34
S.D.	(.58)	(.83)	($p \leq .001$)
N	127	308	

Table 5 presents FIPSE and non-FIPSE students' mean ratings on the scale, Preparation for Teaching Diverse Students. As indicated by the t value, the FIPSE mean rating of 4.13 is significantly higher than the non-FIPSE rating of 3.62.

Table 5. Comparison of Student Group Means on their Preparation for Teaching Diverse Students

	FIPSE Students	Non-FIPSE Students	t Value
$\bar{X}$	4.13	3.62	7.35
S.D.	(.60)	(.79)	($p \leq .001$)
N	128	311	

Qualitative data were also used to document the perceived effect of the FIPSE InServ Project. These data generally supported the quantitative data documenting the perception that FIPSE related courses were preparing students to identify and address the complex educational, social, psychological, and health issues that confront today's children and impede their learning. Some students, however, qualified their positive evaluation by noting that they were in the early stages of their teacher preparation program and would need more time, education and experience to be prepared. Representative comments included in the evaluation report follow.

> "I have learned that there are many obstacles that can impede a child's learning. I am ready and willing to deal with them in the best way I know how."
>
> "I feel that I am becoming better prepared to address and deal with the many issues that confront today's children. However, until you are confronted with the problems face to face, your understanding and preparation is somewhat limited."
>
> "I feel very confident that I know about the various issues that face children today. By discussing them and seeing different sides to these issues in my classes, I have developed ways that I would address these issues as a teacher. I would not say yet that I am fully qualified to handle all of student issues specifically because I still need more experience."

Several students also commented positively on their preparation to collaborate with other professionals to meet children's needs. Illustrative comments follow.

> "I believe that after our in-class, group project, I will be very well prepared. I will be exposed to the roles of many other professionals and how they affect a child's life. I will better understand how to talk with them and what to discuss with them."
>
> "We are doing a project in which collaboration among lawyers, social workers, doctors, and teachers is the goal. This is effective in preparing us for later collaboration with other professionals."
>
> "I feel very prepared in being able to collaborate with other professionals in order to come up with solutions to problems facing children."

Recommendations

Recommendations presented in the second year evaluation report identified two areas for priority attention: interprofessional curriculum development and parental involvement. The proposals regarding curriculum development reflected feedback received from the faculty during the course of the evaluation.

Interprofessional Curriculum Development

1. The FIPSE InServ Project should increase faculty involvement in the development of interprofessional curricula. As noted in the project proposal, course instructors should meet regularly with the Project Co-Directors in order to share teaching/learning experiences regarding the FIPSE related courses. Now that the FIPSE InServ Project has created the context for interprofessional education and training, it may be beneficial to focus more intensively on specific aspects of curriculum development. Initiatives, proposed by some faculty, include creating a systematic plan to transform the curricula; supporting this plan with relevant resources, such as a list of guest speakers for classes and video footage of full-service schools; and providing ongoing leadership and guidance in the development of case studies and other curricula materials relevant to interprofessional training and integrated services. The newly developed interprofessional curricula for pre-service teachers should emphasize the application of theory to practice and incorporate 'real life' situations in the classroom.

Parental Involvement

2. The FIPSE InServ Project should continue to reach out and attempt to increase parents' involvement in their children's education. A first step to achieving this goal may be to identify existing barriers to parental involvement in the schools. Strategies could then be developed to overcome these barriers and facilitate parents' participation in their children's education and in school events. Through increased communication and responsiveness to parents' concerns, the FIPSE InServ Project might realize the ideal goal of collaborating with parents in promoting their children's development.

Discussion

This paper addresses a number of issues that one might encounter in the evaluation of any academic or professional degree program. The first issue is the importance of utilizing theory in the construction of the evaluation design; several theoretical models of program evaluation were incorporated in the design for this study. A second fundamental and generalizable issue is the essential role of implementation analysis in assessing the program's impact. A valid inference about outcomes requires sufficient documentation of the program's implementation.

This study demonstrates how an evaluation can reflect a project's developmental phases by progressing from a formative to a summative approach. The implementation analysis illustrates how one can transform daily activities and events into a chronicle of accomplishments. The process evaluation manifests how a general theoretical or conceptual approach can provide an organizing structure and illuminate lessons to be learned from an evaluation. The second and third year evaluations identify two methodologies - surveys and case studies - potentially relevant to the outcome phase of an evaluation. Finally, the recommendations illustrate how negative findings can be transformed into constructive proposals for improvement.

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WHAT PRICE A NITTANY LION?
TUITION AND FEES AT PENN STATE FROM 1859 TO 1996

Michael J. Dooris
Director of Academic Assessment
The Pennsylvania State University
417 Old Main
University Park, PA 16802

O. Richard Bundy, III
Assistant Director of Annual Giving
The Pennsylvania State University
101 Rider House
University Park, PA 16802

The rising cost of attending college is a sensitive topic for higher education. This paper introduces the broad policy issues in a national context, then examines the experiences of a single institution—Penn State University.

The National Context

Articles about scary college costs are a staple of popular magazines and newspapers. But those stories can be misleading. They often feature prices at the finest and most expensive institutions, which of course do have a disproportionate share of the nation's best students, scholars, and influence. But no single sector is representative of U.S. higher education. Elite private institutions only enroll about three percent of America's undergraduates. Seventy-five percent of the nation's enrollments are in public higher education. The universities of the Big Ten alone grant 20 percent of the nation's doctorates, 15 percent of its masters degrees, and 8 percent of its baccalaureates. Also, the popular press usually discusses sticker prices, not real costs to students. Typically, prominent private institutions have an effective discount rate (based on grants from institutional funds) of about one-third of published tuition and fees. Substantial discounting occurs at other types of institutions, as well. For all four-year institutions, about one-half to three-fourths of

students typically receive aid (the numbers vary by type of institution). Total institutional aid and federal aid have both increased in recent years. And public colleges' charges for tuition, room, and board have been essentially flat, in constant dollars, over the past thirty years (General Accounting Office, 1995; Hubbell, 1995).

It is also clear that the U.S. system works. The number of Americans enrolled in college is at an all-time peak. The percentage of citizens graduating from college is the highest in the world. Compared to high school graduates, college graduates earn about two-thirds more, experience lower unemployment rates, and enjoy a lifetime annual return (taking into account indirect costs, foregone income, and so on) of about 13 percent on their investment in a baccalaureate degree (Leslie & Brinkman, 1988). The alarms about higher education are exaggerated.

On the other hand, a 30-year national survey of entering freshmen showed those entering in Fall 1995 were more worried about college affordability than any entering class since 1966 (Sax et al., 1995). Are those concerns justified? In some respects, yes. However, questions about this topic are difficult to answer categorically.

Important indicators in this area can support different and even contradictory conclusions. For example, the inflation-adjusted cost of attending a public college has held steady since the mid-1960s. However, at private institutions, tuition and fees have outpaced inflation for just about any period in the past five to thirty years. For example, the sticker price at private institutions rose by 4.5 percent per year *in inflation-adjusted dollars* from 1980 to 1990 (Clotfelter, 1996). And even at public institutions, tuition and fees outpaced inflation for much of the 1980s and early 1990s—a period in which tuition helped compensate for stagnant or declining state

appropriations. The trend of declining state support may have struck bottom in 1992 and 1993 (Hines & Higham, 1996).

The changes are complex and inter-related. The student share of costs doubled from 17 percent to 34 percent, from 1950 to 1990, even though the total family share essentially held steady. This reflects the growing numbers of adult, independent students, and the shift away from federal aid in the form of grants toward loans (Hauptman, 1993). While federal student aid is substantial and continues to grow, the mix of grants and loans has changed from about 75 percent in grants to about two-thirds in loans since the 1970s. Researchers believe that rising tuition rates, changing patterns of aid, and increased net costs to students have diminished college access, graduation rates, and college choice. These concern pertain not exclusively, but especially, to low-income students (General Accounting Office, 1995; Mumper, 1996).

In sum, the big picture of causes and effects is difficult to interpret. The family share of cost may not have changed, but the share borne by students has doubled. Prices have increased sharply—except for some sectors and some time periods. Participation is high and increasing, but access and participation of low-income and under-represented students and college choice for many students have suffered. In view of the complexity of aggregate data and trends, it is reasonable to look elsewhere for insight, as well.

The Institutional Context

Economist Charles Clotfelter's highly regarded 1996 book, Buying the Best, provided detailed analyses of four prestigious private institutions (Chicago, Duke,

Harvard, and Carleton). It is an excellent demonstration that, given the state of the art of the economics of higher education, case studies are necessary, appropriate, and informative. Broad trend data and public policy discussions about college cost, access, and affordability are fine. But understanding also requires detailed, disaggregated, institutional data, and interpretation in the context of a specific university's history and circumstances.

Tuition is one factor in institutional management, one part of the planning and budget balancing act. Included in that balancing act are enrollments, financial aid, instructional workload, classroom capacity, faculty and staff salaries, plant maintenance, purchases of books, instrumentation, and computers. Especially in relation to matters such as these, tuition is increasingly viewed pragmatically. There is an emphasis on maximizing revenue and/or maintaining or promoting market share, through strategies such as pre-payment plans, user charges, cost pricing, and differential pricing. Beyond these relatively mechanical, essentially budgetary issues are more amorphous, but nonetheless critical, concerns. These include vulnerability to charges of greed, bloat, and unresponsiveness; the capacity to support the creation and extension of knowledge through research and graduate education; the size, shape, and character of the curriculum; and the rise or fall of institutional prestige. State-supported institutions must also pay attention to their ability to carry out the mission of providing public access to high quality education.

Unexamined Questions about Tuition History

Any well-managed college or university has considerable self-knowledge. Penn State is no exception. The institution has considerable data on enrollments

(72,000 and rising); tuition and fees ($5,258 at the main campus, also rising); the percentage of students receiving financial aid (78 percent); the average loan debt of baccalaureate students at graduation ($13,000); the default rate (4.7 percent); rates of tuition increases (average of 8.9 percent from 1967-68 through 1995-96); faculty salaries ($77,600 for full professors at the main campus); how these figures compare to those of peer institutions; and much more.

However, few institutions have a long-term perspective of their tuition. Until recently, Penn State was unable to answer clearly questions such as the following. How have charges for and policies about tuition, room, and board changed over the history of the university? How do the changes compare to changes in the costs of other goods, services, and wages? How does the price tag from the earliest days compare to the price of today? Are recent charges unreasonable by historical standards?

A Recurring Theme

The 60 boys who entered Pennsylvania's Farmers High School in February 1859 each paid $100 to cover their educational expenses for the institution's first academic year. That $100 covered room and board, tuition, washing, and fuel; students were required to furnish and clean their own rooms. In 1864, those fees were raised to $200 per year. That was Penn State's first fee increase, and in a sense it remains the biggest. Never again have charges been doubled at a single stroke. (This example also illustrates the difficulty of tracking charges over time. There is no 1996 equivalent for the "room and board, tuition, washing, and fuel" of 1859. More will be said on limitations soon.)

Dissatisfaction with costs has been a recurring theme. In 1897, chemistry students accused the college of "discrimination," because they were required to pay practicum fees for laboratory courses while other students enjoyed free tuition. In 1961, the university's president publicly warned that tuition (then $525 per year) could not go much higher "without seriously affecting the ability of our young people to go to college." In 1986, the president of the university responded to student pressure by appointing the President's Advisory Committee on Alternatives to Tuition Increases (there weren't many). The current president convened a task force in 1996 to consider possible revisions to the tuition structure. Today's concerns about tuition are not completely new.

Data Limitations

How does Penn State's $100 price tag of 1859 compare to today's price (for tuition, room, and board) of $9,558?

This is not a simple question to answer. For example, from 1859 to 1878, students were either required or given the option to work (the policy varied during those early years) in the fields, shops, and barns to keep charges low. From 1872 to 1960, the word "tuition" was officially inaccurate, since there was technically no tuition charged to Pennsylvania residents. During most of that period, however, students were billed for "incidentals" in addition to room and/or board and various other items, such as laboratory and equipment fees. The fees approached room and board charges in size, however, and were of a magnitude well beyond "incidental." In 1960, the university, for the first time in the twentieth century, officially set a charge for tuition.

The handling of room and board at Penn State also varied considerably over the years. For most of Penn State's pre-1950s history, room and board were not offered as a package. In the 1920s, meals were offered as an option in addition to dormitory rooms, but to women students only. During the 1920s, 1930s and 1940s, most men lodged off campus, and those who lived in dormitories made their own arrangements for meals at downtown restaurants, boarding houses, eating clubs, or fraternities.

For these reasons and others (such as calendar revisions, the imposition of various fees, and differential tuition rates), it is impossible to develop perfectly comparable charges for room, board, and tuition. It is also difficult to precisely correlate changes in tuition levels to broader price shifts over 136 years. An earlier analysis (Dooris, 1989) provided the methodology for working within the limitations of the available data, and also provided detailed data that do not fit within the scope of this present paper. Although variations over the years make precision an elusive goal, reasonable comparisons are possible.

Consumer Prices

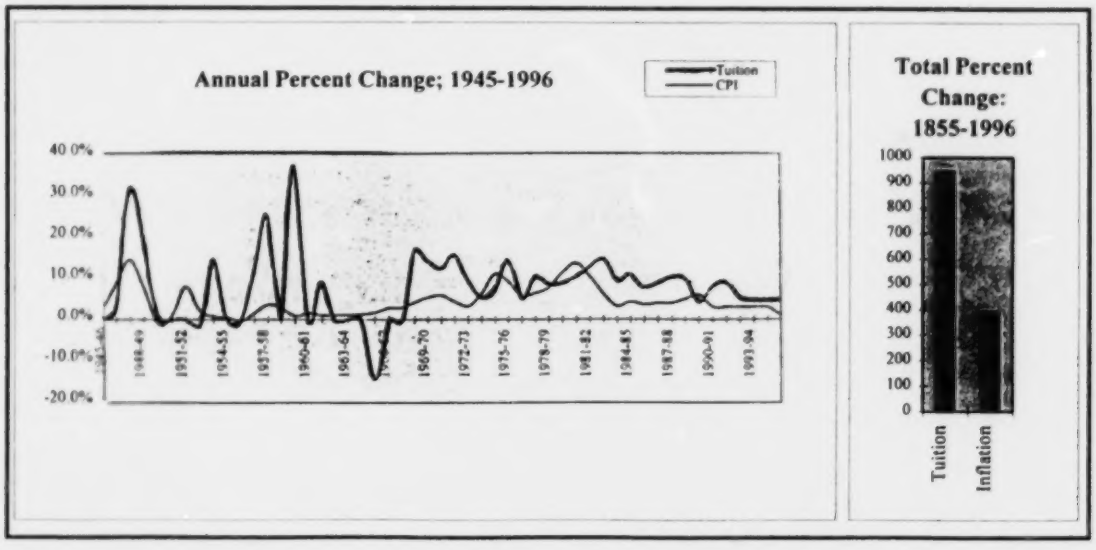
The movement of Penn State's fees for tuition and room and board over the past 136 years has been fairly consistent in direction with general inflationary or deflationary trends, although the magnitude of shifts has been greater. Figure 1 shows how Penn State's tuition has related to the Consumer Price Index, especially since 1945. While consumer prices rose by 75 percent from 1945 to 1965, Penn State's tuition, room, and board costs rose by 140 percent: at about a two-to-one rate. From 1965 to 1995, the CPI rose by about 380 percent, and Penn State's charges rose by

650 percent: again, roughly two-to-one.. From 1986 through 1995, the CPI went up 41 percent while Penn State's charges increased 74 percent. (Although the CPI is not an ideal indicator, it is a consistent and usable benchmark for this analysis.)

During the past 136 years, Penn State's charges have increased at more than twice the rate of inflation—945 percent as opposed to 392 percent. Throughout, Penn State's charges have risen more quickly than the CPI during inflationary periods, and fallen more slowly during deflationary periods. In short, the recent relationship between Penn State's increases and inflation rates in recent decades and in the post-World War II period is fairly consistent with the approximate two-to-one relationship that has existed for 136 years.

Figure 1. Tuition and Consumer Price Index

Percent Change of Tuition vs. CPI - Historical



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Tuition Relative to Other Institutions

When the Farmers High School opened its doors in 1859, in the infancy of public higher education, its tuition was about one-third the rate charged by most other colleges in Pennsylvania. Well into the 1920s, when Penn State had established itself as a legitimate modern college, tuition rates were one-half to one-third those of the most expensive institutions. In 1928, when Penn State's tuition was $132, tuition at Temple (at the time, privately controlled) was $215; the University of Chicago, $270 to $300 per year; Boston University, $300; and Yale, about $350 per year (Robertson, 1928). Similar data for 1945 show Penn State at about one-third the cost of an Ivy League or other top-tier private institution (Good, 1946). By the 1995-96 academic year, Penn State, with in-state tuition of $5,258, compared to Bucknell at $19,730; Boston University at $19,700; Yale at $21,000; Chicago at $20,193; and Harvard at $20,444 (U.S. Department of Education, 1995). Costs at elite private institutions ran up especially rapidly in the 1980s. Relative to those universities, Penn State is now a bit less expensive—at about one-fourth the tuition—than at any other time in history.

Income Levels

Income levels are more relevant to changing college costs, and the ability to pay those costs, than a market-basket price index. Penn State's tuition as a percentage of the income of households headed by a college graduate has trended upward slowly, within the range of about four to eight percent. In 1939, tuition ($135) was five percent of earnings, at $2,600; in 1985, tuition ($2,760) was six percent of earnings, at $46,000; and in 1993, tuition ($4,822) was eight percent of earnings, at $56,000 (U.S. Bureau of the Census, series; U.S. Bureau of the Census, 1975). From 1964 to

1995, tuition at Penn State and average U.S. salaries grew at virtually identical rates—488 and 489 percent, respectively (U.S. Department of Labor Statistics, 1995).

Faculty Salaries

Penn State's charges for tuition, room, and board have usually been one-sixth to one-eighth professors' average salaries. In the 1860s, professors in large institutions earned average salaries of about $1,000 per year, while Penn State's charges were about $100 to $200. In 1929, the average faculty salary was about $3,100 (U.S. Bureau of the Census 1975)—approximately seven times Penn State's charges. For 1995-96, the average salary for professors in doctoral institutions of $73,610 (The Chronicle of Higher Education, 1996) was about eight times the $9,558 price of tuition, room, and board at Penn State.

Other Indicators

Similar comparisons can be made with other historical cost and income measures. Penn State tuition has become less expensive, for example, in relation to farm values and farm incomes over the past century, and less expensive in relation to health care costs in the past 50 years. (For more detail, see Dooris, 1989.)

Conclusions

Two notions emerge from this analysis. First, the combination of trends for aid, tuition, and college attendance do not portray a system that is obviously out of control nationally. This appears true for the particular institution examined closely here, as well. The cost of a Penn State education today is not exorbitant, by the historical standards established during the past 136 years. In many respects, the

university's cost has maintained a consistent relationship to inflation rates, and to average income levels, faculty salaries, and tuition at top private institutions.

The second point, however, is this. Any complacency that might have accompanied such a conclusion ten or fifteen years ago is hard to justify today. Shifting federal aid patterns, reductions in the proportion of state-appropriated support for public institutions, concerns about college access and affordability, and increasing pressures for productivity and accountability have changed the environment. Penn State—no doubt like many public universities—will want to continue exploring aggressive and innovative approaches to matters of tuition, student aid, productivity, cost control, and institutional quality.

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Who Does the Community College Serve? One College's Experience
(A Workshare)

Eleanor Fujita
Director, Academic Information
City University of New York

All colleges provide profiles of their student body. However, while such a profile provides a snapshot of who is attending the college, it does not provide any basis for interpreting *how well* the college may be functioning in terms of enrolling persons in the service area. Understanding how the institution is serving various groups within the population is of particular importance to community colleges which were founded to serve specific geographic areas, and especially, for urban community colleges serving diverse populations. It is also important that the resulting data be comprehensible to fellow administrators, planners and colleagues.

In order to explore the question of how well the college was enrolling its constituent residents, the research office at an eastern urban community college calculated, what staff termed, "service rates" based on a variety of demographic characteristics. These rates or indices provided the research office a standard measure for comparing the college's service to different groups within the population which could be easily understood by colleagues.

The college had previously been evaluated by state officials who used a single index which was essentially the percentage of county residents at least eighteen years of age who were enrolled in a given fall term (penetration or "market penetration" rate). Further the state officials used this one statistic, without any context, and compared the community colleges with one another. The results were unproductive. The statistic was an abstract one which did not in any way aid officials at any of the colleges in understanding how their particular college was functioning in its environment. In fact, the use of the measure needlessly encouraged an attitude that suggested some colleges were doing a fine job and others a poor one. In fact, no one really knew if this was true or not. No college was given a handle to understand how it was doing in enrolling those who needed a college education. No consideration was given as to whether there were other opportunities within a county (a state or private college) for residents to obtain a college education, whether the adult population already had a college education or not, or whether the residents could afford the time and money it took to further their education. The abstract but simplified index simply did not serve a very useful purpose.

The index would have cleared one hurdle if it had been used to take context into consideration, but the abstract nature of the statistic would still have presented a problem. The calculations often resulted in numbers less than one percent, and expressed to two decimal places they were quite abstract and difficult to comprehend. Since we were in the business of serving people, it did not make a lot of sense to say

we were serving the community at a rate of .06. We found that by using a base of 10,000 rather than 100 we could express the results in terms of whole persons. And further, we decided that if we called the results "service rates" we would better describe the business we were in.

The service rates were calculated essentially the same as a percentage (or a market penetration rate) but using a larger multiplier: we divided the number of enrolled students eighteen years of age or older by the number of residents who were also eighteen or older and then multiplied the results by 10,000.

Our first goal was to learn what portion of our population we were serving and to be able to express it in a way that would make sense to the college community. Our second goal was to learn whether, as time passed, we were serving more or less of our population from year to year, since recruiting and retention were being emphasized. Our third, and perhaps most important, goal was to consider our context, to find how we were doing at serving different groups of residents within the county. Essentially, we wanted to learn who we were serving, and conversely, who we were not serving. To do this we calculated service rates for each municipality within the service area. Then, within each municipality we would calculate service rates for according to educational achievement level, race/ethnicity, gender, age, and finally on a combination of factors. And, our final goal was to present the results to the college community. This we did by treating the entire project of finding who the college was serving as a mystery to be solved. Each month, in the staff newspaper new evidence was presented until we got closer and closer to solving the mystery of just who it was the college was serving--and who it was not serving. With these goals in mind, what was it that we found?

The Results

Over Time:

In the Fall of 1990, the college was enrolling 62 of every 10,000 residents aged eighteen years or older. However, by the Fall of 1994, after five years of steady growth, the college was serving 40 percent more residents: 87 of every 10,000.

Five Year Enrollment and Service Rates* for All Residents 18 Years of Age and Older		
Term	Enrollment	Service Rates*
Fall 1990	2685	62
Fall 1991	2732	63
Fall 1992	2948	68
Fall 1993	3307	77
Fall 1994	3755	87

*Note: Service Rates based on population eighteen years old and over (430,695) as determined by 1990 U.S. Census; service rates were derived by dividing the enrollment by population eighteen years of age and older and then multiplying by 10,000.

The Municipalities:

We concentrated on the Fall 1994 enrollment for a more thorough analysis. As we calculated the service rates for the twelve municipalities within the service area, the wide range of service became evident. In one municipality we were serving a high of 113 of every 10,000 residents, and in another we serving a low of only 22 persons of every 10,000. The two main sites of the college were located within or very near the five municipalities who were served at the higher-than-average rate. Classes were held in the high schools of outlying municipalities, but service rates were predictably lowest for those areas where few or no classes were offered.

Service Rates* Fall 1994 for All Residents 18 Years of Age and Older by Municipality			
Municipality	Population 18 Plus	Enrollment	Service Rates*
Municipality # 1	11,830	26	22
Municipalities # 2 & 3	12,254	34	28
Municipality # 4	27,420	96	35
Municipality # 5	27,815	141	51
Municipality # 6	49,284	293	59
Municipality # 7	38,516	316	82
Municipalities # 8 & 9	36,704	362	99
Municipalities # 10 & 11	54,169	543	100
Municipality # 12	172,703	1944	113

*Note: Service Rates based on population eighteen years old and over as determined by 1990 U.S. Census.

Achievement Level:

As mentioned previously, the college was enrolling 87 of every 10,000 residents in the county in the Fall of 1994. Since the primary mission of the college was to offer programs leading to degrees, it seemed appropriate to consider the college's success in enrolling residents who had not yet attained a college degree. When the service rate was calculated for this group of residents for the Fall term of 1994, it was found that the college was serving 113 of every 10,000 such residents -- the service to this group was 30 percent higher than to the general population. Since almost none of the enrolled students entered with a college degree already in hand, the

service rates which increased each year were considerably higher than for the service to the general population without regard to educational achievement.

Five Year Enrollment and Service Rates* for All Residents 18 Years of Age and Older Without a College Degree		
Term	Enrollment	Service Rates*
Fall 1990	2685	81
Fall 1991	2732	82
Fall 1992	2948	88
Fall 1993	3307	99
Fall 1994	3755	113

*Note: Service Rates based on population eighteen years old and over (333,451) without a college degree using figures from the 1990 U.S. Census.

We then looked at the service to those without college degrees in each municipality and found that the service to these residents was between 22 to 41 percent higher than to the general population in the municipality and ranged from a low of 31 persons enrolling for every 10,000 to a high of 147 in the municipality in which the main college site was located. We also found that the lower service rates for the general population in some of the municipalities were to an extent justified: the residents had already achieved a higher level of education and were less in need of a community college education.

Race/Ethnicity:

Service to the residents categorized on the basis of race/ethnicity varied widely from a low of 30 of every 10,000 white residents enrolled to a high of 787 of every 10,000 of those who did not identify with one of the four predominant racial and/or ethnic categorizations.

Service Rates* Fall 1994 for All Residents 18 Years of Age and Older by Race/Ethnicity			
Race/Ethnicity	Population 18 Plus	Enrollment	Service Rates*
Other	1563	123	787
Asian	26,317	463	176
African American	48,585	667	137
Hispanic	134,946	1839	136
White	219,205	663	30
Total County	430,616	3755	87

Note: Due to slight variations in census data taken from different Summary Tapes, totals here differ from those in other tables.

Gender:

Women enrolled at nearly one and one-half times the rate of men. One hundred one of every 10,000 women were enrolled, but only 72 of every 10,000 men.

Service Rates* Fall 1994 for All Residents 18 Years of Age and Older by Gender			
Gender	Population 18 Plus	Enrollment	Service Rates*
Men	205,099	1481	72
Women	225,596	274	101
Total	430,695	3755	87

Age:

While common wisdom says that community colleges enroll slightly older persons than other colleges, at this college proportionately more of the younger persons in the county were enrolled, especially youth eighteen and nineteen years of age--an age when they were presumably directly out of high school.

Service Rates* Fall 1994 for All Residents 18 Years of Age and Older by Age Groups			
Age Groups	Population 18 Plus	Enrollment	Service Rates*
18-19 Years of Age	14,495	552	381
20-24 Years	44,094	1355	307
25-29 Years	60,820	605	99
30-49 Years	164,248	1132	69
50 and over	147,038	111	8
Total	430,695	3755	87

Multiple Characteristics:

When we looked at multiple factors, we found that for every age group we were serving women at a higher rate than men, but in one municipality we were actually serving men at a higher rate than women--in fact at the highest rate of any group.. We learned that, while for most municipalities the college was serving the 18-19 year old students at the highest rate, in one area we were serving those slightly

older at the highest rate. We found that we were serving the different racial/ethnic groups differently depending upon which municipality we were considering: for example, the service to African Americans ranged from 0 to 206 enrolled per 10,000 residents depending upon the municipality; for Hispanics it ranged from 55 to 188; for Asians it ranged from 45 to 199; and for whites it ranged from 11 to 41.

Generally we found that we were serving young women in municipalities near the main college sites at the highest rate (enrolling over 400 of every 10,000). But in two municipalities the college was also serving men 18 to 19 years old at these high rates (494, 597). In each municipality the college was serving those 50 years old and older at the lowest rate (less than 20 of every 10,000 enrolled), but in the municipalities furthest from the main college sites, men 25 to 49 years of age were served at the lowest rates.

Summary

We knew that the college enrolled more women than men; however, before we conducted the study, we did not know just how differently the college was enrolling men and women. A college profile would have indicated that Hispanics composed the largest racial/ethnic category of students at the college, but after the study we knew better how we were serving each group within each municipality. The flat profile reflected the make-up of the college and was, of course, useful for programming, but it was not useful for understanding the data, nor for the evaluation of nor planning for enrollment efforts.

However, the study was not without limitations. For example, comparable information, as of achievement level, for the students and of the residents was not always easily accessible; yet it is necessary if the analysis is to be credible. Further comparisons considering the achievement level of the students to that of county residents would be very productive but comparable data for this variable is not readily accessible. Also, annual rather than ten-year, census data would have made the tracking of the college's progress more accurate.

While there is a trove of data now available and awaiting further analysis, college-to-similar-college comparisons are needed, and questions of why it is that certain groups of persons are not enrolling need to be answered, college officials have a better understanding of who it is that the college is serving and the use of Service Rates has provided a vehicle for making the data accessible to the college community.

Author's Note: The author is appreciative of the support of Mark Oromaner, Dean of Planning and Institutional Research, Hudson County Community College, NJ in the conceptualization of this research and for the challenge to derive a means for expressing its service to the community in terms of its context which Marvin Greenberg, formerly of Rutgers University, gave the college.

GLASS CEILINGS AND STICKY FLOORS AT SUNY
IS THERE GENDER/RACE BIAS IN ACADEMIC RANK?

L. Haignere, Ph.D.
Director of Research
United University Professions

B. Eisenberg, M.P.H.
Research Assistant
United University Professions

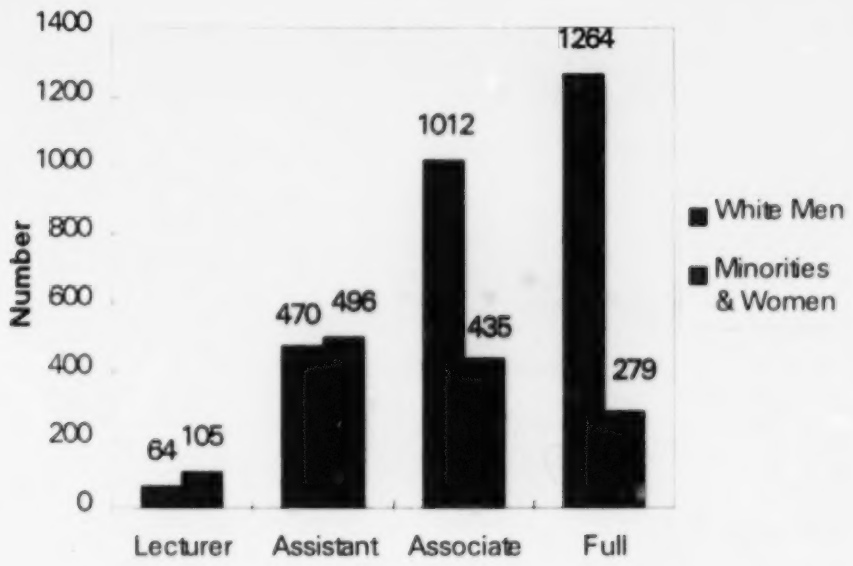
Abstract - This study uses categorical modeling to examine gender and race bias in rank assignments at 12 State University of New York (SUNY) institutions: four universities, four colleges and four two-year institutions. At two-year colleges there is a pattern suggesting that reaching the tenured rank of Associate Professor is a glass ceiling for women. The four-year college pattern is diverse but with evidence of a sticky floor pattern for women and minorities in the non-tenure track rank of Lecturer. There are hurdles at most levels for three of the four universities. But University C results suggest much less bias than the other SUNY universities, indicating that bias can be avoided.

Introduction

Rank assignments affect the professional lives of all faculty. If gender or race bias enters into rank assignments, then some faculty will be in lower ranks than they qualify for and deserve. This is critical to an individual's career because status and salary are tied to an individual's rank. If a qualified individual is in a lower than deserved rank, s/he will not only have lower status, s/he will also have a lower salary. Thus, sticky floors - being stuck in low level ranks - and glass ceilings - not being able to attain the highest rank levels - can seriously impinge upon a person's career. Categorical analyses can be used to diagnose where gender/race bias may be creating a sticky floor or glass ceiling obstructing the promotion of women and minorities.

There is ample nationwide evidence that women and minorities are disproportionately at lower ranks (Gray 1988,1990,1993). This pattern is abundantly evident at SUNY schools as indicated by Figure 1. "Yes, but" the response frequently comes back, "women and minorities are in lower ranks because they tend to have less education or fewer years of experience or publish less." The research reported here does not control for performance measures like publishing and teaching, but it does test whether or not education or years of experience can account for the rank differences found in Figure 1.

Figure 1
Full-Time Faculty at 12 SUNY Schools* by Rank, Gender and Minority Status



*Includes 4 University Centers, 4 Four-Year Colleges, and 4 Two-Year Colleges.

The research reported here was conducted as part of a larger project to create a guide book to assist higher education institutions and bargaining units to assess gender and race inequities in faculty salaries, *Pay Checks: A Guide to Achieving Salary Equity in Higher Education*.

One component of *Pay Checks* was a method of assessing whether or not bias exists in the awarding of rank. Salary equity studies have spawned a debate over whether or not to include rank as a predictor of salary. Some feel that rank is a critical element in the salary analysis (Fogel, 1986; Schrank, 1988; Moore, 1993), while others oppose including rank as a predictor variable (Scott, 1977; Allen, 1984). Those who are against including rank argue that it is a potentially tainted variable, and its inclusion in the regression model will underestimate the gender/race bias in faculty salaries (Ransom & Megdal, 1989; Scott, 1977 AAUP Salary Kit). Since the same administrative units, processes and individuals who set salaries also heavily influence rank and tenure decisions, one would expect that if salary patterns are biased then promotion patterns are likely to be biased as well (Allen, 1984).

The methods used to assess whether or not rank would be a bias-masking variable in predicting salary can also be used diagnostically to suggest whether rank assignments incorporate barriers to the advancement of women and minorities.

Categorical modeling can make visible the ranks where women and minorities are underrepresented relative to their years of experience and educational attainment.

Methods

The Model - Rank is a categorical variable and, therefore, can not be studied in the same way that continuous variables, like salary, can be studied. A categorical variable classifies subjects into a limited number of categories. Even if we assign numbers to each category or level, the categorical variable does not become continuous because the intervals between each level are not equal. Rank provides a good example. We do not know if the difference between being an Instructor and an Assistant Professor is the same as the difference between being an Associate Professor and a Full Professor, or whether an Associate Professor is worth twice as much as an Instructor and four times as much as a Lecturer.

To study the categorical variable of Current Rank requires a statistical method called multinomial logit modeling (Aldrich & Nelson, 1984; DeMaris, 1992; Jobson, 1992; Menard, 1995; Santner & Duffy, 1989). We call it categorical modeling for simplicity. Like regression modeling, categorical modeling has a dependent variable and predictor variables and can control all other predictor variables while it tests the effect of Gender or Race. In this study, Years of Experience and Highest Degree are held constant to see if men and women/minorities with the same qualifications are proportionally found in the same rank.

We used a generalized multinomial logistic regression model, which uses maximum likelihood tables. A more specific logistic regression was not used because in ten out of twelve data sets, the levels of the response variable (Rank) were not parallel with regard to predictor variable effects (e.g. Years at the Institution is not worth the same for Instructors as it is for Leading Professors). The weighted least squares method of estimation was not used because it is more sensitive to very small data pools than the maximum likelihood tables method. Even with over 800 faculty (as was the case with our largest school), when separated by rank, and within rank by individual profiles for each of the predictor variables, the results are very small data pools from which the model produces estimates. Discriminant Analysis would not work because some of the predictor variables, such as Gender and Race, are categorical.

Unlike regression, categorical modeling cannot handle many predictor variables. Therefore, as a rule of thumb, we reduced the number of variables analyzed whenever possible.

Categorical modeling results are odds ratios, where the odds of women and/or minorities being in one rank rather than another rank are compared with the same odds for White men. Figure 2 illustrates the odds ratio, which can also be thought of as a pairwise comparison of adjacent ranks. For example, if there are 18 White-female Lecturers and 54 White-female Assistant Professors and 9 White-male

Lecturers and 54 White-male Assistant Professors, then the odds ratio for the females is 2 to 6, but 1 to 6 for the males. Thus, the White females are twice as likely as the White males to be in the rank of Lecturer as opposed to Assistant Professor.

Figure 2 — A pairwise comparison for gender bias

The Odds Ratio		
Number of White females in rank A / Number of White females in the next higher rank	Compared to	Number of White males in rank A / Number of White males in the next higher rank

Categorical modeling is more complicated than these simple ratios because it controls for the independent variables, such as Previous Experience, Educational Attainment and Years at the Institution, in developing the ratios. Also, to produce the best estimates, the model uses all available information, even for those ranks not directly involved in the particular comparison under review (all the data for Instructors, Lecturers, Full and Leading Professors are used to create estimates comparing Assistant to Associate Professor).

It should be noted that these analyses do not test bias in promotion across time. Individuals are not traced as they move from one rank to another. These analyses look only at one moment in time. They assess the relative odds of being in one rank or the other. They answer the question: Are White men with a specific level of Educational Attainment and Years of Experience more likely to be at a higher rank than women and minorities with the same level of Educational Attainment and Years of Experience? Because the variables entered in these analyses are only demographic variables concerning education and experience, the **results should be interpreted with caution**.

Data Sources - Twelve SUNY schools were individually analyzed for gender and race bias in Current Rank. These included four two-year colleges, four four-year colleges and four universities. The four universities in these analyses are doctoral-level institutions. Three of the colleges are comprehensive institutions, and the other college is a general baccalaureate institution. The remaining four institutions are two-year technical colleges.

The data sets for these analyses were collected in 1992 as a result of a collectively bargained agreement between UUP and SUNY to jointly conducted multiple regression analyses of faculty salaries at 29 SUNY higher education institutions. The data collection process involved three levels: each of the local 29 campus Employee Relations and/or Personnel Offices supplied the initial data information; the SUNY Central Administration Office of Employee Relations and Personnel Operations

coordinated the collection of the data; and the UUP Research Department did the checking and cleaning of the data sets. Not surprisingly, there were initially many data errors and missing data. We sent repeated reports noting data problems to each campus. In all cases, we persisted until we had complete data that appeared, on its face, to be accurate.

In selecting the twelve SUNY institutions for the guidebook, our first criterion was attaining the broadest possible cross section of different sized data sets within each institutional type. A second consideration was the accuracy of the data and ease of correcting any belatedly discovered data errors. The four selected two-year colleges include both the largest (244) and smallest (99). The four selected four-year colleges range in size from 421 to 117 faculty members, and the four university centers, from 811 to 477. This variety in faculty size and institution type enabled us to observe the effects of the different statistical approaches relative to this diversity.

Variables - The dependent variable, known as the response variable in categorical modeling, was Current Rank. We used all the categories of Current Rank at a given institution[1], unless the modeling failed as a result of ranks with fewer than three individuals. This situation existed at four of our institutions. One university and one college had only two instructors, so instructors were dropped from these analyses. Two colleges each had only one leading professor so leading professors were dropped from these analyses.

We included the predictor variables Race, Gender, Highest Degree, Years Since Highest Degree at Time of Hire,[2] Previous Experience at the Time of Hire, Years at the Institution, and quadratic terms to control for curvilinearity in the time related variables.[3] Bearing in mind that it is important to keep the number of variables down, we included the available variables that most influence achieving rank.

To avoid zero cells, we did not include every race/gender combination (White male, White female, African American male, African American female, Asian male, Asian female, Latino male, Latino female) in the model.[4] Instead, we analyzed White

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[1]We found it important to drop from the analysis any empty rank categories. If you do not do this and mistakenly review the results with the impression that the rank was included, you may misinterpret the output. So, before starting any modeling, we identified the ranks with faculty in them and dropped all others.

[2]This variable is a specific, verifiable date, but it may credit women with more experience than they have earned. So, to be conservative, we chose to include the variable previous experience as well. The previous experience data is less reliable than the Years Since Degree at Time of Hire due to the difference in perceptions regarding what constitutes valid previous experience. However, we included it to minimize any tendency to over credit women for experience relative to Years Since Degree.

[3]To eliminate the potential of redundancy when using quadratic terms we centered the time variables.

[4]See Appendix B of Haignere et. al. 1996 for a discussion of zero cells and the problems they create in modeling categorical data such as rank.

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females, Minority males and Minority females as compared to White males. Likewise, though we had nine levels of educational attainment, we found that at SUNY universities and four-year colleges, 90 percent or more of the faculty have either a master's or doctoral degree. As a result, we reduced the variable to two levels: Ph.D. and non-Ph.D. At SUNY two-year colleges, most faculty have masters degrees. Thus, we used MA & Above and Below MA in the categorical modeling analyses.

Results

Figure 3 provides the categorical modeling results for the 12 SUNY schools. At 9 of the 12 SUNY institutions examined there is clear evidence that women and minorities are not assigned to ranks as high as White men with the same highest degrees and comparable years of experience.

As a guide in interpreting the tables in Figure 3, University A rank assignments of Lecturer as opposed to Assistant Professor can be read as follows: The odds ratio for the category White female is 2.96[5]. This means that White women are 2.96 times more likely than White men to be Lecturers rather than Assistant Professors. When reviewing the same rank assignments for Minority males, the odds ratio is 3.69. This means that Minority males are 3.69 times more likely than White males to be Lecturers rather than Assistant Professors. Minority females come the closest to approximating the distribution of White men in these two ranks. They are 1.75 times more likely to be Lectures rather than Assistant Professors.

University Centers - At the University Centers, women and minorities were likely to be in lower ranks than White men with comparable career attributes. At University A, for instance, the findings suggest gender bias hurdles for each rank assignment comparison and both gender and race bias at the lowest comparison, Lecturer to Assistant. In contrast, University C results suggest little gender and race bias. Minority females at University C are shown to be 2.92 times more likely to be Lecturers than Assistant Professors. However, this result should be interpreted in light of the low numbers of Minority women

Universities B and D findings suggest bias patterns that fall between the patterns observed at Universities A and C. At universities B and D there is evidence of both gender and race bias between the rank assignments of Assistant and Associate. University B results suggest more gender bias at the lower rank comparisons, while University D results suggest more gender bias at the higher rank levels.

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[5] The p-Value for each ratio indicates the statistical significance levelthat would be used if this were a random sample. However, we are studyingthe entire population of faculty at each institution in 1992. The Whitefemale ratio for Lecturers to Assistants at University A reaches a p-Valueof.7 which is just short of statistical significance at the .05 level. Formore information on the significance of significance when you are studyinga population see Haignere et. al. 1996 p. 75-77.

Figure 3 - Bias in Rank Results at 12 SUNY Schools

University A

	Lecturer to Asst.		Asst. to Assoc.		Assoc. to Full	
	Odds	pValue	Odds	pValue	Odds	pValue
White Female White. Male	2.96	0.0741	2.62	0.0063	5.21	0.0001
Minority Male White Male	3.69	0.1505	1.08	0.8859	0.82	0.6598
Minority Female White Male	1.75	0.5644	4.42	0.0425	4.08	0.1163

	# Lect.	# Asst.	# Assoc.	# Full
Wh. Male	9	57	160	191
Wh.Fem.	16	52	44	10
Min.Male	4	16	14	19
Min.Fem.	3	17	6	3
Totals	32	142	224	223

University B

	Lecturer to Asst.		Asst. to Assoc.		Assoc. to Full	
	Odds	pValue	Odds	pValue	Odds	pValue
White Female White. Male	2.46	0.1234	2.05	0.0890	1.86	0.1204
Minority Male White Male	0.55	0.5435	2.94	0.0413	0.84	0.7370
Minority Female White Male	-	-	5.66	0.2450	0.81	0.8473

	# Lect.	# Asst.	# of	# Full
Wh. Male	11	40	127	132
Wh.Fem.	18	26	36	15
Min.Male	2	24	12	11
Min.Fem.	0	5	2	2
Totals	31	95	177	160

University C

	Lecturer to Asst.		Asst. to Assoc.		Assoc. to Full	
	Odds	pValue	Odds	pValue	Odds	pValue
White Female White. Male	0.74	0.6079	1.37	0.4141	1.33	0.2986
Minority Male White Male	0.43	0.2194	1.43	0.3603	1.12	0.7127
Minority Female White Male	2.92	0.2193	1.62	0.6029	0.57	0.5395

	# Lect	# Asst.	# Assoc.	# Full
Wh. Male	14	72	184	275
Wh.Fem.	8	36	46	34
Min.Male	4	34	34	33
Min.Fem.	4	6	3	3
Totals	30	148	267	345

Figure 3 (Continued)
University D

	Lecturer to Asst.		Asst. to Assoc.		Assoc. to Full	
	Odds	pValue	Odds	pValue	Odds	pValue
White Female White. Male	1.07	0.9061	2.26	0.0440	2.87	0.002
Minority Male White Male	0.94	0.9330	2.39	0.0679	1.23	0.586
Minority Female White Male	1.20	0.8239	14.81	0.0110	1.48	0.711

	# Lect.	# Asst.	# Assoc.	# Full
Wh. Male	11	65	120	215
Wh. Fem.	7	31	40	17
Min.Male	3	26	19	23
Min.Fem.	3	13	2	2
Totals	24	135	181	257

College E

	Lecturer to Asst.		Asst. to Assoc.		Assoc. to Full	
	Odds	pValue	Odds	pValue	Odds	pValue
White Female White. Male	2.79	0.1372	2.25	0.0633	1.09	0.817
Minority Male White Male	4.97	0.1715	5.05	0.0950	0.47	0.263
Minority Female White Male	21.07	0.0168	1.02	0.9875	1.91	0.475

	# Lect.	# Asst.	# Assoc.	# Full
Wh. Male	6	40	117	122
Wh. Fem.	8	32	37	17
Min.Male	2	7	4	11
Min.Fem.	2	3	6	2
Totals	18	82	164	152

College F

	Lecturer to Asst.		Asst. to Assoc.		Assoc. to Full	
	Odds	pValue	Odds	pValue	Odds	pValue
White Female White. Male	1.78	0.5346	0.73	0.6062	2.22	0.241
Minority Male White Male	-	-	4.88	0.2844	2.64	0.354
Minority Female White Male	-	-	-	-	-	-

	# Lect.	# Asst.	# Assoc.	# Full
Wh. Male	6	45	50	46
Wh. Fem.	11	28	16	5
Min.Male	0	4	3	2
Min.Fem.	0	4	0	2
Totals	17	81	69	55

Figure 3 (Continued)

College G

	Lecturer to Asst.		Asst. to Assoc.		Assoc. to Full	
	Odds	pValue	Odds	pValue	Odds	pValue
White Female White. Male	4.36	0.1571	0.85	0.6983	1.02	0.965
Minority Male White Male	-	-	1.82	0.3815	1.58	0.476
Minority Female White Male	0.1720	13.16	3.37	0.3791	-	-

	# Lect.	# Asst.	# Assoc.	# Full
Wh. Male	2	40	77	90
Wh. Fem.	4	22	30	14
Min.Male	0	9	7	6
Min.Fem.	1	5	1	0
Totals	7	76	115	110

College H

	Lecturer to Asst.		Asst. to Assoc.		Assoc. to Full	
	Odds	pValue	Odds	pValue	Odds	pValue
White Female White. Male	2.48	0.4921	3.06	0.1385	1.05	0.938
Minority Male White Male	-	-	0.64	0.7450	-	-
Minority Female White Male	-	-	6.24	0.2809	-	-

	# Lect.	# Asst.	# Assoc.	# Full
Wh. Male	2	15	32	15
Wh. Fem.	4	13	16	8
Min.Male	0	5	4	0
Min.Fem.	0	1	2	0
Totals	6	34	54	23

Technical Institution I

	Lecturer to Asst.		Asst. to Assoc.		Assoc. to Full	
	Odds	pValue	Odds	pValue	Odds	pValue
White Female White. Male	0.63	0.7803	7.77	0.0074	1.47	0.682
Minority Male White Male	-	-	0.15	0.2897	0.32	0.422
Minority Female White Male	-	-	-	-	-	-

	# Lect.	# Asst.	# Assoc.	# Full
Wh. Male	3	32	51	49
Wh. Fem.	1	10	6	2
Min.Male	0	1	2	1
Min.Fem.	0	0	0	0
Totals	4	43	59	52

Figure 3 (Continued)
Technical Institution J

	Lecturer to Asst.		Asst. to Assoc.		Assoc. to Full	
	Odds	pValue	Odds	pValue	Odds	pValue
White Female White. Male	-	-	0.49	0.5193	1.11	0.886
Minority Male White Male	-	-	-	-	-	-
Minority Female White Male	-	-	-	-	-	-

	# Lect.	# Asst.	# Assoc.	# Full
Wh. Male	0	16	19	34
Wh. Fem.	0	7	7	6
Min.Male	0	0	0	0
Min.Fem.	0	1	0	0
Totals	0	24	26	40

Technical Institution K

	Lecturer to Asst.		Asst. to Assoc.		Assoc. to Full	
	Odds	pValue	Odds	p-Value	Odds	pValue
White Female White. Male	-	-	3.20	0.0608	0.53	0.338
Minority Male White Male	-	-	1.47	0.7717	-	-
Minority Female White Male	-	-	-	-	-	-

	# Lect.	# Asst.	# Assoc.	# Full
Wh. Male	0	20	28	36
Wh. Fem.	0	13	7	10
Min.Male	0	3	2	0
Min.Fem.	0	3	0	1
Totals	0	39	37	47

Technical Institution L

	Lecturer to Asst.		Asst. to Assoc.		Assoc. to Full	
	Odds	pValue	Odds	pValue	Odds	pValue
White Female White. Male	-	-	2.17	0.1419	1.42	0.480
Minority Male White Male	-	-	0.12	0.0748	0.40	0.315
Minority Female White Male	-	-	1.93	0.6916	0.26	0.377

	# Lect.	# Asst.	# Assoc.	# Full
Wh. Male	0	28	47	59
Wh. Fem.	0	32	22	13
Min.Male	0	3	4	6
Min.Fem.	0	4	1	1
Totals	0	67	74	79

Four-Year Colleges -The variations between the four-year colleges suggest no consistent pattern except that women and minorities are much more likely to be non-tenure track Lecturers than are White men with comparable career attributes. College F results suggest gender bias also at the highest rank assignments of Associate and Full Professors. The results for the other three colleges suggest gender bias is most evident in assignments below the Full Professor rank. Colleges E and H display a pattern similar to the two-year colleges, a gender hurdle in reaching the rank of Associate Professor. The numbers of minorities in the rank comparisons at the four-year colleges are too small to form the basis of conclusions. However, it appears that there may be a race bias hurdle between Assistant and Associate rank assignments at three of these four colleges.

Two-Year Colleges - With the exception of Technical Institution L, there is a notable lack of women and minorities at the two-year institutions examined. However, the numbers are large enough to suggest diagnostic conclusions concerning gender bias across the Assistant to Associate ranks. Women have much lower odds than White men of being awarded the rank of Associate Professor. If they manage to become Associate Professors, their odds of becoming Full Professors are similar to White males. Thus, getting into the Associate Professor rank appears to be a glass ceiling for women at 3 two-year campuses. Technical Institution J, the smallest school, is the exception, and shows no bias toward women. There are not enough minorities at these schools to support any conclusions about race bias.

Conclusions

Three of the twelve schools we studied show very little bias in Current Rank, one at each institutional type, University C, College G and Technical Institution J. This suggests that gender/race bias in rank assignment processes is not universal and some schools have developed more equitable processes than others. At the SUNY institutions where our analyses indicate bias in rank assignment, the results could be used to point to where gender/race bias may be creating a glass ceiling blocking the promotion of women and minorities.

Concerning minorities, the findings indicate a sticky-floor phenomenon holding minorities in the non-tenure track rank of Lecturer. Race bias hurdles reaching the Associate Professor rank are also suggested at some schools. Combining all minorities, as we have done, may mask bias when there is substantial bias against one minority type, but not the others. Despite this potential problem, we chose to combine categories in order to avoid zero cells and to produce better estimates by creating larger pools of data. Even so, as we indicated above, the numbers of minorities are often too small to support diagnostic conclusions.

As we have cautioned above, these analyses do not test bias in promotion across time. Individuals are not traced as they move from one rank to another. These analyses look only at one moment in time. They assess the relative odds of being in one rank or the other. They answer the question: Are White men with a specific level

of Educational Attainment and Years of Experience more likely to be at a higher rank than women and minorities with the same level of Educational Attainment and Years of Experience? Because the variables entered in these analyses are only demographic variables concerning education and experience, the **results should be interpreted with caution**. They indicate whether Current Rank appears to be biased based on only a few predictor variables which include no discipline or performance information. The results are best used only diagnostically to flag where bias may be creating a sticky floor or a glass ceiling blocking the promotion of women and minorities. Further assessments of the institutional processes involved would be necessary to indicate whether or not biases really exist.

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WORKING WITH THE NRC DATA ON GRADUATE PROGRAMS IN THE U.S.: CONSIDERATIONS AND CONCERNS

Robert J. Heffernan, Ph.D.
Paul Snyder, Ph.D.
Tina Grycenkov Paladino
Marie Paulette Matis

Office of Institutional Research and Academic Planning
Rutgers, The State University of New Jersey

INTRODUCTION

This paper is intended as an introduction to the recent National Research Council's (NRC) report on doctoral education in the United States. Particular attention will be given to: placing the NRC study in the context of earlier studies of doctoral education; briefly discussing how the NRC data were obtained, examined and presented; and outlining some of the ways the NRC data can be used to better understand doctoral education at Rutgers. In addition, some of the basic findings of the NRC report as they relate to Rutgers University will be presented.

Interest within and outside the academy in the quality of doctoral education in the United States has been heightened with the release last Fall of NRC's *Research-Doctorate Programs in the United States: Continuity and Change*.[1] This publication updates an earlier study by the Conference Board of Associated Research Councils (CBARC), *An Assessment of Research-Doctorate Programs in the United States*, which was published as a five-volume report in 1982. The NRC publication has received much attention in the media, with articles appearing in the *Chronicle of Higher Education*, *Change* magazine and the *New York Times*. Some reasons for interest in the NRC report include:

- its size - the NRC study surveyed 3,634 doctoral programs at 274 American universities in 41 different academic fields;

- its reputational rankings - subjective program and faculty quality assessments are provided by knowledgeable academics rather than magazine editors or media pundits;

- its wealth of data - both reputational and objective measures on doctoral programs, as well as institutional-level data, are included in this study;

• its consistency with the 1982 study - many of the measures used in the NRC report can be compared with results of the earlier CBARC study;

• its presentational structure - data for institutions and their respective programs were rank-ordered by various measures found in the report, thereby giving readers a quick comparative interpretation of the data;

• its accessibility - much of the data used in the NRC report are not only available in printable form, but can also be accessed electronically from NRC's World Wide Web site; and

• its potential for further analysis and research - researchers have the capability of further analyzing the data found in the NRC study beyond that undertaken by the authors of the report.

BACKGROUND TO THE NRC STUDY

The concern for assessing the quality of doctoral education in the United States has been long-standing. The first serious effort to assess doctoral programs in the United States was undertaken by Raymond Hughes in 1925. Hughes, the then president of the University of Miami at Ohio, conducted a survey of doctoral programs in twenty fields, representing thirty-eight of sixty-seven institutions that offered the Ph.D. at that time. Hughes compiled a list of well-noted scholars and asked each scholar to evaluate between twenty and sixty programs apiece in the scholar's respective academic field.

Although the work of Hughes was well known within academia and did not go uncriticized,[2] it wasn't until the 1960s and especially the 1970s that studies designed to assess the quality of doctoral education in the United States expanded. Reviewers have categorized the many and varied studies that have sought to assess the quality of doctoral programs into three general types: reputational studies; objective indicator studies; and quantitative correlate studies.[3] Most of the well-known studies have been of the reputational type -- the subjective evaluation of doctoral programs by faculty and/or academic administrators (e.g., departmental heads and deans) to arrive at a rating for programs within an academic field. Although well-known, these studies have also received the most criticism. The essential argument against reputational studies has been that these inquiries are more an assessment of a program's faculty reputation rather than an indicator of a program's overall quality.

One set of studies has sought to correct this limitation by assessing a program's quality through readily available objective indices of faculty research production. The rationale for this approach is that the quality of a department is necessarily dependent on the quality of its faculty. However, the problem with this position

relates to the lack of consensus with how faculty quality can be measured. Such studies have relied, for the most part, on measures such as the number and type of publications and citations, but have also included non-faculty indices such as student outcomes and institutional or departmental financial resources.

Another type of study, often called quantitative correlate studies, has aimed at understanding the components of doctoral program quality by seeking to determine those variables that are most strongly related to reputational information about a program. Using many of the measures found in objective indicator studies, correlate studies have the potential of contributing to institutional planning by identifying measures that underlie quality of different doctoral programs (e.g., faculty size, number of full-time professors, etc.).[4]

Many criticisms, both methodological and conceptual, have been leveled against all three types of studies. In addition to the criticism that many of these studies, and especially reputational studies, tend to confuse the reputation of a doctoral program for quality, other criticisms that have been directed at studies of doctoral education include the existence of: rater bias; outdated data; unreliable and incorrect data; unidimensionality (i.e., the lack of including more than one indicator of quality); and an atheoretical focus (this latter criticism is often cited against correlate studies). Although these critiques tell us that we should be careful when interpreting the results of these studies, they also have contributed to an ongoing refinement of studies of this kind. The NRC study represents the most recent and perhaps the most comprehensive response to date to the shortcomings of the earlier studies.

THE METHODOLOGY OF THE NRC STUDY

Average characteristics of the institutions participating in the NRC report are found in Table 1. This table distinguishes among public and private institutions and various categories of the Carnegie classification system of higher education institutions.[5] Table 1 displays data derived from 105 private and 169 public institutions. Research I institutions comprise the category with the most schools (there are 90 Research I institutions accounting for 33% of all schools included in the NRC study).

The main purpose of the NRC report was to present figures on individual programs in 41 academic fields. Academic fields included in the NRC report were based on three criteria: 1) the number of Ph.D.s produced nationally; 2) the number of programs training Ph.D.s within a particular field; and 3) the average number of Ph.D.s produced per program. Overall, 3,634 research-doctorate programs at 274 universities were included in the 1993 study.

Two types of measures were collected for this study: *reputational measures* and *data from secondary sources*. Reputational measures were obtained for each institutional program based on the ratings given by faculty within a particular field. For each program, ratings of quality (of the faculty), effectiveness (of educating scholars), and the perceived change in quality (over the last five years) were obtained. Each faculty member who was included in the study was asked to rate approximately 50 programs in his or her field. For each institution, raters were given a faculty listing to be used as a reference. Approximately 100 ratings per program were obtained and the mean of these ratings was used to obtain an overall score for each program.[6]

The data from secondary sources include information from four categories: faculty (e.g., total number of faculty in program, % of faculty publishing between 1988 and 1992); students (e.g., % of female students); doctoral recipients (e.g., % of doctoral recipients with research or teaching assistantships as a primary source of support, median number of years to complete Ph.D.); and institution (e.g., year of first Ph.D., average research expenditure).

One of the features of the NRC report that makes it so impressive is its spanning of the three categories of studies mentioned above. Not only are reputational and objective measures of doctoral programs presented, additional analysis and discussion are also provided with regard to the relationship between the reputational measures used in the study and some of the secondary indices compiled for individual doctoral programs. The NRC report also presents some findings comparing institutions with regard to certain measures of change obtained from the 1982 CBARC and 1993 NRC studies (e.g., the change in the "Scholarly Quality of Program Faculty") and closer examination of the items that profile graduates of the various doctoral programs included in the report.

IMPORTANCE OF THE NRC RANKINGS TO RUTGERS

NRC data can be useful to faculty and staff at Rutgers because they place our doctoral programs in a multi-dimensional comparative context. First, these data provide *longitudinal information*. For example, the designers of the NRC study insisted on the comparability of as many measures as possible between the 1982 CBARC and 1993 NRC reports. Thus it is possible to see how a particular program has fared during the period between the administration of the two studies. Although not an overt longitudinal measure, the reputational measure, "Change in Program Quality in Last Five Years," provides additional insight with regard to program status over the recent past in the eyes of peer faculty.

Second, these data allow us to *compare Rutgers' program characteristics to those of similar programs offered by other universities*. These comparisons can be made against national averages or they can be made against specific subgroups of

universities. The importance of such peer comparisons cannot be over stated. Institutions of higher education vary by size, type of control, educational mission and other characteristics (e.g., regional distinctions and physical location) that often make comparisons among the different groupings of institutions senseless and, at times, misleading.[7] Even among members of the Association of American Universities (AAU), of which Rutgers is a member, a further distinction needs to be made between private and public AAU schools when deciphering the data in the NRC report. For example, Figure 1 shows that private AAU institutions consistently have more programs listed in the top ten of the "Scholarly Quality of Program Faculty" measure, on average, than public AAU institutions. Although the extent of the difference between these averages varies by academic area, it is clear from Figure 1 that doctoral programs from private AAU institutions are rated as having a higher quality of faculty than public AAU institutions. Some would interpret the data in Figure 1 to be an indication of the superiority of private AAU institutions in the administration of doctoral programs, while others would argue that these rankings instead show the biased nature of such reputational rankings.[8] However, an equally valid interpretation would acknowledge the success of doctoral education among the private AAU institutions while recognizing the confluence of historical and financial factors that make private AAU institutions different from all other institutions of higher education, including public AAU schools.

Third, these data allow us to analyze Rutgers' academic achievement *at a variety of levels*. For example, academic success can be evaluated for specific programs (e.g., Psychology, Aerospace Engineering) and academic areas (e.g., Arts and Humanities, Biological Sciences). In addition, overall numbers for Rutgers (across academic areas) can be derived and assessed.

SELECTED FINDINGS

Quality of Faculty Ratings (Table 2a, attached)

Comparison Between Rutgers' 1982 and 1993 Ratings

Quality of faculty ratings increased for most Rutgers' doctoral programs between 1982 and 1993 for which there are comparable data. The most notable increases occurred in Philosophy (from a mean rating of 2.5 on a six-point scale in 1982 to 3.8 in 1993), Chemical Engineering (1.8 to 2.7), Electrical Engineering (1.8 to 2.8), and Computer Science (2.4 to 3.3).[9]

Comparison of Rutgers' 1993 Ratings with National and Peer Statistics

In general, Rutgers' quality of faculty ratings are comparable to or higher than the national average. The following Rutgers' doctoral programs received ratings substantially above the national average: English (mean rating of 3.9 for Rutgers vs.

the national average of 2.7), Philosophy (3.8 vs. 2.8), Biochemistry and Molecular Biology (3.5 vs. 2.6), Mathematics (4.0 vs. 2.8), Physics (3.8 vs. 2.8), History (3.7 vs. 2.8) and Psychology (3.8 vs. 2.7). In general, Rutgers received quality of faculty ratings which are comparable to that of the public AAU averages, and the public AAU schools scored consistently higher than the national average. Moreover, Rutgers does very well when compared to the average scores for public AAU institutions from the Northeast region.[10]

Change in Program Quality (Table 2b, attached)

Consistent with the findings discussed above, the quality of the faculty in almost all Rutgers' programs is considered to have significantly improved during the five years prior to 1993. On a scale from -1.0 to +1.0, where 0 represents no change, almost all Rutgers' programs received positive ratings between .23 and .64. In comparison, the national average positive ratings for programs on this measure generally range from about .01 to .24. Rutgers also scores favorably well when national and Northeast public AAU institutions are considered. Average positive ratings for the various doctoral programs among national public AAU schools range from .02 to .42, among the Northeast public AAU schools these scores range from 0.0 to .52.

Program Effectiveness Ratings (Table 2c, attached)

Comparison Between Rutgers' 1982 and 1993 Ratings

Program effectiveness ratings increased for many Rutgers' programs between 1982 and 1993 for which there are comparable data. These increases ranged from .1 in Physics and French Languages and Literature to 1.2 in Philosophy and Chemical Engineering.

Comparison of Rutgers' 1993 Ratings with National and Peer Statistics

In general, Rutgers' program effectiveness ratings are comparable to or higher than the national average. The following Rutgers' programs received ratings substantially above the national average: English (mean rating of 3.7 for Rutgers vs. the national average of 2.8), Mathematics (3.6 vs. 2.6), History (3.7 vs. 2.8) and Psychology (3.7 vs. 2.8). In general, Rutgers received program effectiveness ratings which are comparable to those of national public AAUs and exceeded those of the Northeast public AAUs.

Faculty and Student Information (Table 3, attached)

Rutgers' faculty and student statistics are similar to both public AAU and the national average on a number of measures. For example, the range for the percentage of full professors among various university groupings listed in Table 3 is

between 49.9% and 55.5%, with 53.9% of Rutgers' full professors participating in doctoral programs. All four categories of institutions in Table 3 also have an approximate percentage of faculty members who received an honor or award between 1986 and 1992 (these values range from 8% for public AAU schools in the Northeast to 9.7% for national and public AAU schools). Furthermore, on average, each Rutgers' program produced approximately 30 Ph.D.s between 1988 and 1992, compared to 29 on the national level and among Northeast public AAU schools. Public AAU schools averaged a slightly higher number of Ph.D.s per program during this period (36.6). On average, it took slightly under ten years (9.9) for students to complete their Ph.D. at Rutgers; this average compares to 9, 9.5 and 9.2 for national, Northeast public AAU and national public AAU schools, respectively.

Rutgers is somewhat different than the national average on three other measures. First, given Rutgers' size, it should be no surprise that the average number of faculty participating per program at Rutgers (37.5) is significantly greater than the national average (21.0) and somewhat greater than the public AAU (30.6) average. Second, the percentage of program faculty at Rutgers publishing between 1988 and 1992 (76.8%) was somewhat greater than the national average (69.7%) and on par with the public AAU average (78.2%). The percentage of Ph.D.s awarded to women is higher at Rutgers (36.1%) than the national (30.7%) or public AAU average (30.4%). Finally, Rutgers also has a higher percentage of Ph.D.s awarded to minorities when compared to all public AAU and Northeast public AAU institutions (6% compared to 5.5% and 5.8%, respectively).

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ENDNOTES

[1] While the NRC survey was only released last September, the report is based on survey data collected during 1993 and secondary data from 1986 through 1992.

[2] Two frequently mentioned criticisms of Hughes' work were that the size of his panel of experts for rating a given program was too small and that there was a geographical imbalance among the scholars evaluating the programs, with most of the raters residing in the Northeast and Midwest.

[3] Conrad and Blackburn (1985) and Tan (1986).

[4] Ehrenberg and Hurst (1996) is a recent example of how the combination of reputational measures and objective indicators may be used to inform institutional planning.

[5] All American colleges and universities that are degree-granting and accredited by an agency recognized by the U.S. Department of Education are included in the Carnegie classification system. There are twenty classification categories in the Carnegie system, with the bulk of doctoral degrees coming from four categories. These include Research I, Research II, Doctoral I and Doctoral II institutions. For a full description of the various Carnegie classifications, see *The Chronicle of Higher Education*, April 6, 1994. For a complete listing of AAU institutions, both public and private, see the *1995-1996 Rutgers Fact Book*, p. 107.

[6] More specifically, these averages do not include the two highest and lowest scores in the computation of the mean.

[7] One misleading effect of comparing institutions of differing sizes, types and/or mission is what the authors of one report (Graham, A.G., R.W. Lyman, and M. Trow, 1995) have called epistemic drift -- the tendency for institutions to respond to external accountability requirements and reports in a manner that may be contrary to their own interests. For example, an institution with a few doctoral programs but a strong undergraduate program may seek to aspire to the rating levels that major private universities often achieve in reports such as the NRC study by re-allocating its energies and resources from the area that is its strength (i.e., undergraduate instruction). The likelihood that such an institution will achieve significantly better ratings for its few doctoral programs is low, given that it probably lacks the institutional resources needed for such improvement, while at the same time weakening the area where it is quite successful.

[8] This is akin to the "halo" effect argument that sees reputational rankings contributing to a pecking order among institutions such that evaluations of a specific

program are inextricably connected to the institution's overall reputation. As Tan has noted (1986, p. 231), some critics see this as possibly contributing to an institution's lack of innovation due to the belief that such embracing of change imperils that institution's reputational ranking. In certain ways, this is the opposite of the tendency toward epistemic drift noted above.

[9] Although this comparison of reputational scores between the 1982 and 1993 reports indicate that many Rutgers' doctoral programs experienced gains in their ratings, it is not entirely clear if these increases are the result of "real" improvement or "grade" (i.e., rating) inflation (i.e., that the 1993 raters were more lenient in their evaluation of programs). One indication that these increases are, in fact, reflective of improvement in doctoral education at Rutgers is the positive scores for Rutgers found in the "Change in Program Quality" reputational measure that is discussed shortly. For a discussion of score changes and the existence of grade inflation, see Appendix R in the NRC report.

[10] In addition to Rutgers, these Northeast public AAU institutions include Maryland, Penn State, SUNY at Buffalo and Pittsburgh.

Table 1

Characteristics of Institutions Participating in the NRC Study by Control, Carnegie Classification, and AAU Membership

AVERAGE	PUBLIC						PRIVATE					
	AA	RES I	RES II	DOCT I	DOCT II	OTHER*	AA	RES I	RES II	DOCT I	DOCT II	OTHER
Total R&D (x $1,000)	136,188	113,054	33,589	6,118	12,498	24,225	109,784	112,785	23,783	5,415	7,581	9,115
Federal R&D (x $1,000	78,008	62,100	13,256	2,437	5,659	13,408	80,327	83,028	14,489	3,498	5,304	6,199
Library - 1992												
Volume	3,975,936	2,980,04	1,587,100	1,019,882	614,76	296,438	3,552,328	3,439,441	1,508,952	983,700	664,222	351,87
Expend (x $1,000)	17.56	13.85	7.139	4.837	3.30	2.389	16.118	16.258	7.58	4.701	3.15	1.82
Enrollment - 1992												
Total	30.81	28.86	20.020	17.410	12.64	4.821	12.673	13.378	11.10	9.004	5.61	2.34
Graduate Student	7.00	6.07	3.637	3.690	2.38	919	5.165	5.111	3.19	3.142	1.27	75
Number of Programs												
198	2	2	1				22	2	1			
199	3	2	1				28	2	1			
First Year Ph.D. Awards	187	187	1891	1934	191	1952	1960	186	187	1897	188	186

*Includes institutions with Carnegie Classification in specialized doctoral programs such as medicine, theology, etc.

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Figure 1

Average Number of Doctoral Programs in Top Ten of Quality of Faculty for Each Major Academic Area

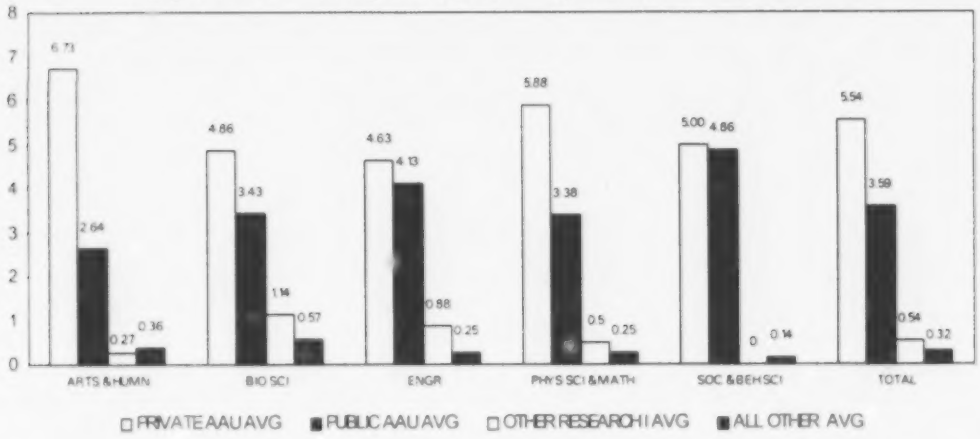

Table 2a

Quality of Faculty Ratings

ACADEMIC AND PROGRAM AREAS	RUTGERS 1982 MEAN RATING	RUTGERS 1993 MEAN RATING	1993 NATIONAL STATISTICS	1993 PUBLIC AAU	1993 NORTHEAST PUBLIC AAU
NEW BRUNSWICK					
ARTS AND HUMANITIE					
Art History	2	3	3	2	2
Comparative Literature	*	2	3	2	2
English Language and Literatur	3	3	2	3	3
French Language and Literatur	2	3	3	2	2
German Language and Literatur	1	1	3	3	1
Music	3	3	3	3	3
Philosophy	2	3	2	3	3
Spanish and Portuguese Language & Literatur	2	2	3	3	2
BIOLOGICAL SCIENCE					
Biochemistry and Molecular Biology	3	3	2	3	2
Cell and Developmental Biology	*	3	2	3	2
Ecology, Evolution and Behavior	*	3	2	3	3
Molecular and General Genetics	*	3	2	3	3
Neuroscience	*	3	2	3	2
Pharmacology	*	3	3	3	3
Physiology	3	3	2	3	3
ENGINEERIN					
Biomedical Engineerin	*	3	3	3	3
Chemical Engineerin	1	2	2	3	2
Electrical Engineerin	1	2	2	3	3
Materials Science (Ceramic Science & Engineering)	*	3	3	3	3
Materials Science (Materials Science & Engineering)	*	2	3	3	3
Mechanical Engineerin	2	3	2	3	3
PHYSICAL SCIENCES & MATHEMATIC					
Chemistry	2	3	2	3	3
Computer Scienc	2	3	2	3	3
Mathematic	3	4	2	3	3
Physic	3	3	2	3	3
Statistics and Biostatistics	3	3	3	3	2
SOCIAL AND BEHAVIORAL SCIENCE					
Anthropology	3	3	3	3	3
Economic	1	2	2	2	2
Geography	2	3	3	3	3
History	3	3	2	3	3
Political Science	3	3	2	3	2
Psychology	3	3	2	3	3
Sociology	3	3	2	3	2

ACADEMIC AND PROGRAM AREAS	RUTGERS 1982 MEAN RATING	RUTGERS 1993 MEAN RATING	1993 NATIONAL STATISTICS	1993 PUBLIC DOCT II
NEWARK				
BIOLOGICAL SCIENCES				
Biochemistry and Molecular Biology	*	1	2	1
Ecology, Evolution and Behavior	*	2	2	2
Neuroscience	*	2	2	1
PHYSICAL SCIENCES & MATHEMATICS				
Chemistry	1	1	2	1
SOCIAL AND BEHAVIORAL SCIENCES				
Psychology	2	0	2	1

* Programs not included in the 1982 study

Note: Quality of Faculty Ratings are based on a six point scale in which "5" = Distinguished and "0" = Not sufficient for doctoral education

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Table 2

Change in Program Quality

ACADEMIC AND PROGRAM AREAS	RUTGERS 1993 MEAN RATING	1993 NATIONAL STATISTICS	1993 PUBLIC AAU	1993 NORTHEAST PUBLIC AAU
NEW BRUNSWICK				
ARTS AND HUMANITIE				
Art History	3	0	0	1
Comparative Literature	0	0	-0	-0
English Language and Literatur	5	1	2	3
French Language and Literatur	2	0	0	1
German Language and Literatur	-2	-0	-	-1
Music	-4	0	0	-0
Philosophy	9	0	1	1
Spanish and Portuguese Language and Literature	0	0	0	0
BIOLOGICAL SCIENCE				
Biochemistry and Molecular Biology	5	2	2	1
Cell and Developmental Biology	4	2	3	1
Ecology, Evolution and Behavior	3	2	2	3
Molecular and General Genetic	5	2	3	5
Neuroscience	6	2	2	1
Pharmacology	7	2	2	4
Physiology	5	2	2	3
ENGINEERIN				
Biomedical Engineenn	3	2	4	4
Chemical Engineenn	4	0	1	2
Electrical Engineenn	3	1	2	2
Materials Science (Ceramic Science and Engineering	3	0	2	1
Materials Science (Materials Science and Engineering	3	0	2	1
Mechanical Engineenn	3	0	2	2
PHYSICAL SCIENCES & MATHEMATIC				
Chemistry	2	0	2	1
Computer Scienc	2	1	2	1
Mathematic	4	1	2	3
Physic	6	1	2	2
Statistics and Biostatistic	1	0	0	0
SOCIAL AND BEHAVIORAL SCIENCE				
Anthropology	3	0	1	2
Economic	2	0	0	1
Geography	5	0	0	2
History	4	1	2	1
Political Scienc	3	0	1	1
Psychology	3	0	1	1
Sociology	2	0	0	2

ACADEMIC AND PROGRAM AREAS	RUTGERS 1993 MEAN RATING	1993 NATIONAL STATISTICS	1993 PUBLIC DOCT II
NEWARK			
BIOLOGICAL SCIENCE			
Biochemistry and Molecular Biology	-2	2	0
Ecology, Evolution and Behavior	-3	2	0
Neuroscience	7	2	0
PHYSICAL SCIENCES & MATHEMATIC			
Chemistry	0	0	-0
SOCIAL AND BEHAVIORAL SCIENCE			
Psychology	-2	0	1

Note: Ratings are based on a scale of -1 to +1 in which "1" means better than 5 years ago and "-1" means poorer than 5 years ago.

Table 2c

Quality of Program Effectiveness Ratings

ACADEMIC AND PROGRAM AREAS	RUTGERS 1982 MEAN RATING *	RUTGERS 1993 MEAN RATING	1993 NATIONAL STATISTICS	1993 PUBLIC AAU	1993 NORTHEAST PUBLIC AAU
NEW BRUNSWICK					
ARTS AND HUMANITIE					
Art History	2	3	3	2	2
Comparative Literature	**	2	3	2	2
English Language and Literatur	3	3	2	3	3
French Language and Literatur	2	2	2	2	2
German Language and Literatur	1	1	2	2	1
Music	2	3	2	3	2
Philosophy	2	3	2	3	3
Spanish and Portuguese Language & Literatur	2	2	2	3	2
BIOLOGICAL SCIENCE					
Biochemistry and Molecular Biology	**	3	2	3	3
Cell and Developmental Biology	**	3	2	3	2
Ecology, Evolution and Behavior	**	3	2	3	3
Molecular and General Genetics	**	3	3	3	3
Neuroscience	**	3	2	3	3
Pharmacology	**	3	3	3	3
Physiology	3	3	3	3	3
ENGINEERIN					
Biomedical Engineerin	**	3	3	3	3
Chemical Engineerin	1	3	2	3	3
Electrical Engineerin	1	2	2	3	3
Materials Science (Ceramic Science & Engineering	**	3	3	3	2
Materials Science (Materials Science & Engineering	**	2	3	3	2
Mechanical Engineerin	2	3	2	3	3
PHYSICAL SCIENCES & MATHEMATIC					
Chemistry	2	2	2	3	3
Computer Science	2	3	2	3	2
Mathematics	3	3	2	3	3
Physic	3	3	2	3	3
Statistics and Biostatistics	2	3	2	3	2
SOCIAL AND BEHAVIORAL SCIENCE					
Anthropology	2	3	2	3	3
Economic	1	2	2	2	2
Geography	2	3	3	3	3
History	3	3	2	3	3
Political Science	2	3	2	3	2
Psychology	3	3	2	3	3
Sociology	2	2	2	3	2

ACADEMIC AND PROGRAM AREAS	RUTGERS 1982 MEAN RATING *	RUTGERS 1993 MEAN RATING	1993 NATIONAL STATISTICS	1993 PUBLIC DOCT II
NEWARK				
BIOLOGICAL SCIENCES				
Biochemistry and Molecular Biology	**	1	2	1
Ecology, Evolution and Behavior	**	3	2	2
Neuroscience	**	3	2	1
PHYSICAL SCIENCES & MATHEMATICS				
Chemistry	1	2	2	1
SOCIAL AND BEHAVIORAL SCIENCES				
Psychology	2	0	2	2

* Recalculated 1982 scores from the four-point to the six-point scaling system

** Programs not included in the 1982 study

Note: Program Effectiveness Ratings are based on a six point scale in which "5" = Extremely Effective and "0" = Not Effective

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Table

Selected Faculty and Student Information

FACULTY/STUDENT INFORMATION	1993 RUTGERS STATISTICS*	1993 NATIONAL STATISTICS	1993 PUBLIC AAU STATISTICS	1993 NORTHEAST PUBLIC AAU STATISTICS
Average number of faculty participating per program	37.5	21.0	30.6	31.1
Average percentage of full professors participating per program	53.9%	50.1%	55.5%	49.9%
Average percentage of faculty with research support per program	28.4%	32.8%	39.3%	35.0%
Average percentage of faculty receiving an award or honor between 1986-1992** per program	8.9%	9.7%	9.7%	8.0%
Average percentage of faculty publishing between 1988-1992*** per program	76.8%	69.7%	78.2%	77.1%
Average number of Ph.D.s produced between 1988-1992 per program	30.3	29.0	36.6	29.2
Average percentage of Ph.D.s awarded to women per program	36.1%	30.7%	30.4%	33.9%
Average percentage of Ph.D.s awarded to minorities per program	6.0%	8.2%	5.5%	5.8%
Average median time elapse (in years) in completing Ph.D. per program	9.9	9.0	9.2	9.5

* Includes New Brunswick Doctoral Programs only

** Among Faculty from the Arts and Humanities

*** Among Faculty from all academic areas other than Arts and Humanities

Note: National and AAU statistics are the averages of each institution

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DEVELOPING A PROFILE OF RETAINED AND ATTRITED STUDENTS

Tracy A. Hunt-White, Associate Director
Planning and Institutional Research
The Catholic University of America

Statement of the Problem

Higher education institutions are faced with declining resources and enrollments, and increasing numbers of academically underprepared students. According to Jones and Watson (1991), one of the factors critical to the survival of higher education institutions is full-time enrollments. They also noted that high attrition levels adversely affect funding, facilities planning, and long-term planning of curriculum (p.1). Thus, it is essential for institutions to develop policies to retain their full-time students, and because of limited resources, these retention policies should be designed based on some knowledge of the characteristics of returning and non-returning students. Developing a profile of returnees and non-returnees will help institutions create more effective and cost efficient retention policies. Also, colleges will be able to target the populations most likely to have high levels of attrition and determine the areas on which retention programs should focus.

Purpose of the Study

The purpose of this study is to help inform retention policies by developing a profile of the characteristics of returning and non-returning students. The study analyzed and evaluated the differences in the selected characteristics of these groups. Specifically, a profile of each group was created with respect to: level of satisfaction with college services, personal characteristics, high school background, college choice, academic performance, institutional support, and reasons for leaving. The following questions were addressed:

1) What is the profile of returning students with respect to selected characteristics?

2) What is the profile of non-returning students with respect to selected characteristics?

3) What are the differences in the selected characteristics of returning and non-returning students?

Data Needs

Cope (1978) emphasized the use of readily available and ascertainable characteristics of students to help identify potential dropouts. Lenning et al. (1980)

believed that easily-obtained data would have comparable accuracy to more complicated and costly measures. Data obtained easily from college admissions tests and questionnaires administered to students during the freshman year would also supply relevant information to measure persistence. Gillespie and Nobel (1992) added that it may be useful to collect information prior to enrollment or early in the first year regarding individual enrollment plans and goals in helping identify potential dropouts.

Several categories of data are necessary for retention studies. They include, but are not limited to the following areas (Gillespie and Nobel, 1992, p.4):

- Background information (i.e., demographics, high school GPA, etc.)
- Initial Commitment to Institution (i.e, purpose for enrolling, choice, reasons for selecting college)
- Initial and subsequent academic goal commitment
- Student/institution academic fit (i.e., perception of relationships with faculty, staff)
- Student/institution social fit (i.e., satisfaction with the environment)
- Student/institution financial fit (i.e, type of aid, hours spent working)

This study uses elements from most of the above categories. Data was gathered using easily accessible and ascertainable data from the Administrative database, freshman surveys, and a student opinion survey.

Methodology

The Office of Planning and Institutional Research created a datafile identifying returning and non-returning students by extracting a Fall 1996 student enrollment file from the Administrative database and matching it to a Fall 1995 enrollment file containing full-time freshmen and sophomores. The database was also used to gather data elements pertaining to the personal characteristics of returning and non-returning students, their high school background, their college academic performance, and their type of institutional support. For non-returning students, a withdrawal student survey administered by the Dean of Students was used to capture reasons for leaving.

To gather information on student satisfaction with college services, the datafile of returning and non-returning students was matched to the respondents of the American College Testing (ACT) Student Opinion Survey which was administered in the spring of 1996 to full-time freshman and sophomore students. The datafile was also matched with the respondents of the 1994 and 1995 Cooperative Institutional Research Program (CIRP) Freshman Survey to provide data on the following: reasons for going to college, reasons for selecting this college, number of colleges applied to, and was this college their first choice.

The Statistical Analysis Software (SAS) was used to generate frequencies and percentages pertaining to the various characteristics of returning and non-returning students. A chi-square test of association was performed on all categorical variables to test the relationship between returning status and categorical variable. The resulting chi-square value indicated whether the distribution of frequencies in each categorical variable differed significantly between each return group.

Results

The percentages displayed in Tables 1 through 4f serve to provide a profile of returning and non-returning students and to show where these groups are significantly different. Table 1 provides data on the background characteristics, college performance, and financial support of each group. Table 2 shows the responses of returnees and non-returnees on selected items from the CIRP Freshman Survey. Table 3 indicates satisfaction with college services and programs and Table 4a through Table 4f show the level of satisfaction with different aspects of the college environment as gathered from the ACT Student Opinion Survey. Below are the tables and highlights from each table. Highlights of students reason for leaving are also provided.

Background Characteristics, College Performance, and Financial Support -- Table 1

With respect to gender, the majority of returning and non-returning students are female. Although the majority of students at CUA are white and U.S. citizens, the groups were different with respect to ethnicity and citizenship. Seventy-nine percent of returning students are white versus 68% of non-returning students. Ninety-one percent of returning students are U.S. Citizens versus 87% of non-returnees. However, while immigrants comprise 3% of returnees, they are 8% of non-returnees.

There was a significant difference between the religious preference of the groups. Eighty percent of returnees are Catholic versus 66% of non-returnees.

There was no significant difference between returnees and non-returnees in how they were admitted. Eighty-four percent of returnees were admitted through non-conditional admissions versus 82% for non-returnees. However, there was significant difference between the groups regarding early decision. Twenty-four percent of returnees were admitted through early decision versus 11% of non-returnees.

Returnees and non-returnees were significantly different with respect to the type of high school they had attended. Sixty-one percent of returnees had attended private schools versus 49% of non-returnees. They were also significantly different in high school GPA. Sixty-seven percent of returnees had a GPA of 3.0 and above versus 57% for non-returnees.

Financial aid revealed a significant difference between returnees and non-returnees. Seventy-seven percent of returnees received aid versus 63% of non-

returnees. Significantly fewer non-returnees received grants than returnees (45% versus 65%, respectively). A higher percentage of returnees versus non-returnees received grants rather than loans.

TABLE 1
Background Characteristics, College Performance, and Financial Support

	Rtn	NRtn		Rtn	NRtn
Female	55%	56%	**High School GPA****		
			3.0 and above	67%	52%
White**	79%	68%	2.0 - 2.9	31%	46%
			Below 2.0	1%	1%
Citizenship*					
US Citizen	91%	87%	**College GPA****		
Immigrant	3%	8%	3.0 and above	51%	37%
NRA	5%	5%	2.0 - 2.9	45%	37%
			Below 2.0	4%	27%
Catholic**	80%	66%			
			Financial Aid		
Early Decision*	24%	11%	Receiving Aid**	77%	63%
			Grants**	70%	53%
Regularly Admitted	84%	83%	Loans**	65%	51%
			Institutional Aid**	65%	45%
Private H.S.**	61%	48%	Government Aid**	66%	52%

*Significant at p<.05; **Significant at p<.01 Rtn=Returned; NRtn=Attrited

Freshman Survey: College Choice, Reasons for Attending College and CUA - Table 2

Seventy-four percent of returnees and 72% of non-returnees selected CUA as their first choice. Only 2% each of returnees and non-returnees indicated that CUA was less than third choice. Slightly more returnees than non-returnees applied to four or more other colleges (61% vs. 57%, respectively).

Almost all of the returnees and non-returnees chose to "learn more about things" and to "gain general education" as the top reasons for attending college. More returnees than non-returnees indicated to "make more money" as a top reason for attending college (93% vs. 88%, respectively). While 97% of non-returnees selected to "get a better job" as a top reason (88% of returnees).

Also note that 69% of non-returnees selected "wanted to get away from home" as a reason for going to college versus 63% of returnees.

Both returning and non-returning groups gave the following as the top important or very important reasons for attending CUA: "Good academic reputation," "Graduates get good jobs," and "Size of institution."

Returnees and non-returnees were significantly different with respect to how important "offered financial aid" was as a reason for attending CUA: 77% of returnees and 59% of non-returnees. They were also significantly different with respect to the importance of "college representative recruitment" as a reason for attending CUA: 25% of returnees and 12% of non-returnees.

TABLE 2
College Choice, Applications, Reasons for Attending College and CUA

	Rtn	NRtn		Rtn	NRtn
Choice of College			**Reasons for Choosing CUA**		
Less than 3rd choice	2%	2%	(% indicated Impt/Very Impt)		
3rd choice	3%	4%	Good academic reputation	98%	100%
2nd choice	21%	23%	Graduates get good jobs	92%	90%
1st choice	74%	72%	Size of institution	91%	88%
			Graduates go to top grd schs	84%	81%
Nbr of Other Coll Applns			Offered financial assistance**	77%	59%
3 or less	39%	43%	Social reputation	75%	76%
4 or more	61%	57%	Religious affiliation	69%	59%
			Special educational programs	60%	49%
Reasons for Attending Coll			Advice of guidance counselor	36%	40%
(% indicated Impt/Very Impt)			Relatives desired it	36%	37%
Learn more about things	99%	100%	Advice of teacher	36%	35%
Gain general education	97%	100%	Friend suggested it	29%	25%
Make more money	93%	88%	Low tuition	27%	23%
Become more cultured	93%	98%	College rep recruitment*	25%	12%
Get a better job	88%	97%	Wanted to live near home	24%	23%
Improve reading/study skills	87%	88%	Athletic recruitment	20%	16%
Parents desired it	73%	72%	Advice of priv coll counselor	10%	14%
Get away from home	63%	69%	Not accepted anywhere else	5%	2%
Mentor encouraged me	47%	36%			

*Significant at $p<.05$; **Significant at $p<.01$ Rtn=Returned; NRtn=Attrited

Satisfaction with College Services -- Table 3

Returnees and non-returnees were not significantly different with respect to their level of satisfaction with college services. More returnees than non-returnees were satisfied with recreational/intramural program (87% vs. 73%, respectively) and student employment services (81% vs. 70%, respectively). Also, both groups had a low level of satisfaction with food services (20% of returnees and 19% of non-returnees).

Returning students had a higher level of satisfaction with resident hall services than non-returnees: 57% of returnees versus 35% of non-returnees. The same relationship was true for college sponsored social activities, 58% of returnees and 42% of non-returnees were satisfied.

TABLE 3
Satisfaction with College Services or Programs

	Rtn	NRtn
Recreational/Intramural programs	87%	73%
Student employment services	81%	70%
Academic advising services	69%	71%
College orientation program	67%	65%
Computer services	64%	82%
College-sponsored social activities	58%	42%
Residence hall services and programs	57%	35%
Financial aid services	55%	53%
Library facilities and services	47%	43%
Food services	20%	19%

Rtn=Returned; NRtn=Attrited

Satisfaction with College Environment -- Tables 4a - 4f

Academic -- Table 4a

Non-returning satisfaction had the lowest level of satisfaction with the following areas: Variety of courses offered by the college (33% of non-returnees and 63% of returnees).

TABLE 4a
Satisfaction with College Environment - Academic

	Rtn	NRtn
Testing/grading system	67%	53%
Course content in major field*	76%	56%
Instruction in major field	76%	63%
Availability of instructor outside of class	73%	59%
Attitude of faculty toward students	76%	67%
Variety of course offered by college**	63%	33%
Class size relative to type of course	84%	70%
Flexibility to design program of study	54%	36%
Availability of advisor	66%	63%
Value of the information provided by advisor	63%	53%
Preparation receiving for future occupation	61%	66%

*Significant at $p<.05$; **Significant at $p<.01$ Rtn=Returned; NRtn=Attrited

Returnees and non-returnees were significantly different with their level of satisfaction with course content in their major field. Seventy-six percent of returnees were satisfied versus 56% of non-returnees.

The non-returnees and returnees were significantly different with respect to their level of satisfaction with the flexibility to design program of study (36% of non-returnees and 54% of returnees).

Admissions -- Table 4b

Both returnees and non-returnee groups had the highest level of satisfaction with the general admissions process (66% and 50%, respectively). Both groups also had the lowest level of satisfaction with the availability of financial information prior to enrolling (51% of returnees and 38% of non-returnees).

Overall, non-returnees had low levels of satisfaction with all aspects of the admission process. The groups were significantly different in their satisfaction with the college catalog/admissions publications (64% of returnees and 43% of non-returnees).

TABLE 4b
Satisfaction with College Environment - Admissions

	Rtn	NRtn
General admissions procedures	66%	50%
Availability of financial aid info prior to enrolling	51%	38%
Accuracy of college info received before enrolling	63%	47%
College Catalog/admissions pubs*	64%	43%

*Significant at p<.05; **Significant at p<.01 Rtn=Returned; NRtn=Attrited

Rules and Regulations -- Table 4c

Very few of the students were satisfied with the rules and regulations on campus. The area with the highest satisfaction for returnees was academic probation and suspension policies (38% for returnees vs. 22% for non-returnees). The area with the highest satisfaction for non-returnees was rules governing student conduct (37% of non-returnees and 32% of returnees).

TABLE 4c
Satisfaction with College Environment - Rules & Regulations

	Rtn	NRtn
Student voice in college policies	32%	21%
Rules governing student conduct	32%	37%
Residence hall rules and regulation	30%	27%
Academic probation/suspension policies	38%	22%
Purposes for which student activity fees used	29%	26%
Personal security/safety on campus	27%	30%

Rtn=Returned; NRtn=Attrited

Personal security/safety on campus was the area with the lowest area of satisfaction for returnees (27% for returnees and 30% for non-returnees). Student voice in college policies was the area with the lowest level of satisfaction for non-returnees (21% of non-returnees vs. 32% of returnees).

Facilities -- Table 4d

Returnees had the highest level of satisfaction with athletic facilities (68% of returnees vs. 59% of non-returnees). Non-returnees had the highest level of satisfaction with the college bookstore (67% of non-returnees vs. 56% of returnees).

TABLE 4d
Satisfaction with College Environment - Facilities

	Rtn	NRtn
Classroom facilities	67%	57%
Laboratory facilities	54%	39%
Athletic facilities	68%	59%
Study area	62%	52%
Student union	32%	20%
Campus bookstore	56%	67%
Availability of student housing	54%	45%
General condition of buildings/grounds	48%	33%

Rtn=Returned; NRtn=Attrited

Both groups were least satisfied with the student union (32% of returnees vs. 20% of returnees) and the general condition of buildings and grounds (48% returnees and 33% non-returnees). Also, only 39% of non-returnees were satisfied with laboratory facilities versus 54% of returnees.

Registration -- Table 4e

Returnees and non-returnees had the highest satisfaction with the academic calendar (65% and 60%, respectively). While 59% of returnees were satisfied with "general registration procedures" versus 40% of non-returnees).

TABLE 4e
Satisfaction with College Environment - Registration

	Rtn	NRtn
General registration procedures	59%	40%
Availability of courses when needed	49%	47%
Academic calendar for this college	65%	60%
Billing and fee payment procedures	37%	23%

Rtn=Returned; NRtn=Attrited

Both returnee and non-returnee groups had the lowest satisfaction with billing and fee payment procedures (37% and 23%, respectively).

General Aspects of the College Environment -- Table 4f

There was a significant difference between non-returnees and returnees with the level of satisfaction with racial harmony at CUA (32% of non-returnee vs. 55% of returnees). There was also a significant difference between the groups with respect to

level of satisfaction with CUA in general (38% of non-returnees vs. 70% of returnees).

TABLE 4f
Satisfaction with College Environment - General

	Rtn	NRtn
Concern for you as an individual	46%	34%
Attitude of staff toward students	49%	48%
Racial harmony at this college*	55%	32%
Opportunities for student employment*	61%	41%
Oppties for involvement in campus activities	62%	45%
Student government	42%	30%
Religious activities and programs	59%	50%
Campus media	53%	48%
This college in general**	70%	38%

*Significant at p<.05; **Significant at p<.01 Rtn=Returned; NRtn=Attrited

Returnees and non-returnees were almost equally satisfied with the attitude of staff toward students (49% and 48%, respectively). Both groups had the lowest level of satisfaction with student government (42% of returnees vs. 30% of non-returnees).

Non-returning students were the least satisfied with opportunities for student employment (41% of non-returnees vs. 61% of returnees) and opportunities for personal involvement in campus activities (45% of non-returnees vs. 62% of returnees).

Reasons for Leaving

To capture data on students reason for leaving, students who withdrew were asked to fill out a survey as part of the withdrawal process. The results from the survey are provided with the knowledge that respondents may not be a representative sample of those who dropped out and also that they may not provide the "real" reason for leaving.

Most of the respondents indicated that they were transferring to another school. Some of the major issues with which respondents were dissatisfied included uncomfortableness with the social atmosphere; lack of social activities on-campus; and lack of diversity. Several respondents cited that they did not feel as if they belonged. Other frequently mentioned issues were drinking by friends and roommates and concern for personal safety on and off campus.

Summary and Conclusion

The findings show noticeable differences between returnees and non-returnees. Non-returnees are significantly different from returnees in ethnicity and citizenship and were more likely to have attended public high school. In addition,

fewer non-returnees received financial aid than returnees and were less likely to be awarded grants.

More non-returnees than returnees were dissatisfied with college sponsored social activities, course content in major field, and the variety of courses offered. They were also less likely to be satisfied with the flexibility to design their program of study.

Non-returnees were less satisfied than returnees with all aspects of the admissions process. They were particularly dissatisfied with the availability of financial aid information prior to enrolling. Also, they were more likely to be dissatisfied with CUA in general, the registration process, racial harmony at CUA, and opportunities for student employment.

In conclusion, the basic attempt of this study was to develop a profile of returning and non-returning students using widely available resources to which most institutional research offices have access and to show some of the variables that are commonly used in retention studies and could be used in developing models to predict retention.

Further Research

Further research to help develop effective retention policies could include administering a survey to attrited students and obtaining an identifier to allow tracking. A longitudinal profile of returning and non-returning students should be developed and maintained. Institutions could evaluate the effectiveness of retention policies before and after revising programs based on knowledge of the characteristics of its returning students. Finally, regression models could be developed to predict a student's likelihood of returning.

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Graduation Rates at the University of New Hampshire
An Historical Perspective - Mortality in Retrospect

John Kraus and Antonietta Taylor
Director and Assistant Director of Institutional Research
University of New Hampshire

Introduction

Graduation rates are now gauges of perceived institutional goodness. This data coin has two sides. Expressed in a positive way, results are graduation or completion rates. These are the students that make it through an institution to degree completion (sometimes said to be "persisters"). The opposite side of this are those that don't finish. They make up the attrition or withdrawal rate (these are also called "leavers" or "dropouts"). As aspects of institutional effectiveness these rates are used for peer comparison and in various rankings such as in *U.S. News and World Report*. The Student Right-to-Know and Campus Security Act at the federal level and the NCAA Report on Graduation Rates both attest to the escalation of concern about how many students finish their programs of study. Media hype has inflamed perceptions. Legislators, governing boards, central offices and others have joined the fray.

What about graduation rates in the past, sixty or seventy years ago? Wouldn't this be relevant to provide a reference point for today? It could be especially important as a backdrop in conversations with those who say that we aren't doing as good a job as "previously." Curious, we determined to discover what graduation rates were at the University of New Hampshire in the 1920s and 1930s. We also would search the literature for comparable data.

Ours is a very straightforward study - select cohorts and track students in them by name through six years at UNH, looking for individual graduation, then compare the results with current rates. We used three cohort years - 1924, 1929 and 1931. The comparison indicates that at UNH we are doing a better job of graduating students now than in the 1920s or 30s. We rediscovered the seminal investigation for this period and find that our historical rates compare favorably with what it indicates. Hopefully our endeavor will provoke some interest in historical aspects of the graduation rate issue.

Background

A review of the literature suggests that retention and dropout studies came into the fore in the 1960s and rapidly became a major issue in higher education. Vincent Tinto indicates that for many this interest sprang from "... a growing realization that in the absence of growing pools of applicants the financial health of their institution is very much affected by their ability to retain a greater portion

of entering students until degree completion. For a number of institutions, particularly those smaller colleges which admit virtually anyone who applies, the issue of dropout and retention is tantamount to that of institutional survival." (Tinto, 1982)

In the 1970s retention research burgeoned. The literature ballooned. Retention task forces and attendance at special attrition or retention conferences or seminars became vogue. Efforts now include comprehensive institutional studies such as the Consortium for Student Retention Data Exchange (CSRDE) established in 1994 at the University of Oklahoma, with over 200 members, and the National Graduation Rate Study at the University of Arizona with over 50 land grant or public research universities participating.

What about the period of interest for this study? Were there discussions about graduation rates or retention in the 1920s or 30s? *College* (Gavit, 1925) is certainly one typical discourse. A review of the index finds reference to "gangs" and "gifted students" but nothing about graduation rates. There is mention of "alumni" and "athletics" but not of attrition. "Drifting" and "drinking" are cited but dropouts is not indicated. Where are these issues covered? The answer is under "mortality," a rather ironic application of the term. This word certainly offers a sense of finality not even conveyed in today's use of "dropout."

One of the abiding causes of the assumption of incompatibility of interest between the student and the teacher-caste is the atmosphere surrounding the subject of examinations and the associated subject of institutional "mortality." Personally I am unable to understand the complacency with which school and college officers and teachers view these things. I know a school where certain influential members of the faculty all but boast of grim satisfaction in what they call "the annual blood-letting."

• • •

I don't know that anybody ever has made a study of the economic waste of the "turnover" and spoilage of material in the business of education, through the permanent moral maiming of the victims of this sort of thing.

• • •

...Perish the thought that every possible effort ought to be made to conserve and develop what the student *has*; to find out and take advantage of what he has acquired. (Gavit, 1925)

This passage vividly captures the spirit of what higher education is trying to do today in retention efforts - to avoid the economic waste of student "turnover." Gone is the apparent luxury (or stupidity) of purging classes through academic or other kinds of hazing. Every student now counts.

Reviews uncovered a single pre World War II study of graduation rates. It is a real gem and, of course, features the key word - mortality. One of a series of U.S.

Office of Education studies undertaken during 1936-37 with financing under the Emergency Relief Appropriations Act of 1935, *College Student Mortality* (McNeely, 1938) is a 112 page bulletin outlining the results of a survey of twenty-five universities. Four year graduation data was collected on first-time full-time students in the freshman class registered for a bachelors degree at the opening of the 1931-32 academic year. Students not graduating were also tracked for one additional year beyond the four. (By wonderful coincidence, our third cohort is also the entering class of 1931.) The study was very comprehensive, with data on 15,535 individual students. It included differences by sex, by years attending, by institutional school or college (discipline), by age, location, lodging, academic achievement, credit hours, and by cause (financial, etc). Participating were 14 publicly controlled and 11 privately controlled institutions. The results of the study are much too detailed for treatment within the limits of this paper but summary data will be displayed with that for UNH as we discuss our results. Overall the percentage of students "obtaining degree during or at the end of 4-year period" was indicated to be 28.3 percent for publicly controlled institutions and 36.4 for private schools. By institution the range was from the high of 57.8 percent to 13.8 percent for the lowest school.

McNeely also confirmed our suspicions that little work on "mortality" had preceded that effort. "Most of the previous studies on this subject have been narrow in scope, being confined to a single institution rather than a group of institutions. Thus little is known as to the differences in student mortality among institutions or the extent to which students leave college generally throughout the United States" (McNeely, 1938). An example institutional study was cited as one by Ohio State University in 1929. A limited survey of land grant colleges and universities was noted as having been conducted by the Office of Education in 1927-29.

We also found that Tinto (1982) developed and graphed "... data on the overall rates of first four-year degree completion of students in higher education over the period 1880-1980. Degree completion rates are calculated by the ratio of the number of BA's or first professional degrees given in any year to the number of first-time degree enrollments four-years earlier." Tinto does not specify his source for the numbers but it must have been summary data from government documents. This is an aggregate method of estimating, omitting by name tracking. His result is that "... rates of completion (dropout) have, with the exception of one period, remained surprisingly constant over one hundred years at about fifty-five (forty-five) percent." He contends that based on this historical pattern which is also what the rate was in the early 1980s "... we should be much more skeptical of optimistic projections of our ability to significantly reduce dropout in higher education at the national level." In other words, there is no room for improvement. It seems to us, as a result of analysis of UNH data and of reviewing the McNeely study (with an overall four year graduation rate of 31.6 percent) that there has been more room for improvement than Tinto's estimation suggests.

Methodology

As our cohorts, we used the entering freshman classes of 1924, 1929 and 1931. We started with 1929. The real trick was to find a reliable source for this antique information. The principal document for our data was a vintage item, the *Bulletin of the University of New Hampshire, Catalog*. We were fortunate. The catalog in the early years included a by name list of all students by class, with college/major, and town and state of residence. Additionally the catalog listed all students who received a degree during the previous year, with separate listings for baccalaureate and associate level students. Our effort only considered baccalaureate level students.

Initially we thought it would be ideal to select a cohort for tracking from each decade in the century. The reality of historical turbulence and data access dictated otherwise. Looking closely at the 1900-09 decade it was clear that the numbers were sufficiently small to make any association with current enrollment a real stretch (Catalogs in this period were, however, wonderful resources containing both complete registers and alphabetical listings of *all* graduates.). The next decade was disrupted by World War I. The twenties and the thirties were consistent but the Depression might have some influence on graduation rates. In the late twenties and early thirties the economy was certainly a concern. The university history states that " . . . the number of tuition scholarships was increased to 225 in 1928-29 and to 250 the following year. By 1933-34, the general economic situation was so bad that the amount available for tuition loans was increased . . . ." (Sackett, 1974).

Then we discovered that, with the 1938 issue, the catalog discontinued listing the names of students. By serendipity, perhaps that was a good end point since World War II would scramble enrollment patterns for the 1940s. And from 1938 forward, we found no ready source of either freshman rosters or graduation names. Not able to undertake major archival mining, we settled on three cohorts from the 1920s and 1930s. Our tracking efforts, however, would, in the end, cover 14 years in those decades.

For an independent checking mechanism of catalog information, we referred to our *UNH Factbook* which includes historical data for the University back to 1868. We knew that those numbers were originally drawn from Registrar's Office summaries. Reviewing counts by class we confirmed that the catalog was a valid source. Counts were always within a handful in both sources (and most often there was only a difference of one or two in each year). Also, with handwritten changes and updates made directly to these earlier undergraduate catalogs, it appeared that these were official, annotated, working documents.

All freshman class names (last name, first and middle initial) for each year were entered into an ASCII file, along with the degree or college indicated, and

gender. We assigned gender and, as you can imagine, in some cases it was difficult to determine whether a name was male or female; however, the middle name usually cleared up any confusion. Once all the names were typed in, they were closely hand checked against the catalog for errors or omissions. The ASCII files were then loaded into System 1032 data bases to establish each freshman cohort.

The same basic procedure was followed for the graduates, at least initially. All names for the graduating classes four years out from the corresponding freshman class were entered into ASCII files. We included last and first name, and middle initial, the degree awarded and the year of graduation. Those separate files were also loaded into graduation data bases.

Extensive manual checking and editing was required. This was time-consuming careful work. Sometimes a first, middle or last name for a freshman record was slightly different from what was indicated for that person in the graduation data. Since mapping from the freshman data base to the graduation data base would only identify exact matches in both data sets, we reviewed all non-matching entries individually to make sure we had indeed captured everyone. We found many instances where spelling of names in the freshman data base was different than in the graduation data. Such anomalies were carefully reviewed and records were altered if needed for consistency. If we determined that a difference in last name was through marriage or other change in status, we amended the records to be consistent in both data sets. In several instances, "Jr." was denoted in one data set but not the other. In these cases, we went back to the catalogs and if we determined that the person was one and the same, we altered the records (e.g. freshman record: Isherwood, Jr., William Lea from Berlin in the College of Technology; graduation record: Isherwood, William Lea from Berlin in the College of Technology--hard to mistake this!). Fortunately we didn't have to rely on just the names. We could check town and state and also major to help verify entries. Once we completed these cross-checking efforts, we were confident that we'd identified all freshmen who graduated in four years.

Our next step was to include three, five and six year graduation rates. To do this we started with the list of freshmen *not* graduating in four years and manually checked the individual names against the graduation lists for those additional years in the catalog. If they were identified in the catalog, we added the entries to the graduation database. We did find instances where first and middle names were reversed between the freshman and graduation lists. Again, by referring to the catalog and checking the entry by town/state of residence and major/college we were able to determine if the persons were one and the same, and if so, records were changed for consistency.

We now had three, four, five and six year graduation data (curiously, three to five percent of the freshmen cohorts graduated with a baccalaureate within three

years). By interactively mapping back and forth, we calculated rates by gender as well as for the total. The tables below display graduation rates for the three historical class cohorts investigated and for three recent 1980s cohorts for comparison.

Fall of Year	# Freshmen	# Grad in 4 years	% Grad in 4years	# Grad in 5 years	% Grad in 5 years	# Grad in 6 years	% Grad in 6 years
Historical Graduation Rates							
1924-25							
Men	370	142	38.4%	172	46.5%	181	48.9%
Women	136	90	66.2%	94	69.1%	94	69.1%
Total	506	232	45.9%	266	52.6%	275	54.4%
1929-30							
Men	329	151	45.9%	181	55.0%	189	57.5%
Women	129	76	58.9%	83	64.3%	83	64.3%
Total	458	227	49.6%	264	57.6%	272	59.4%
1931-32							
Men	396	167	42.2%	185	46.7%	188	47.5%
Women	119	68	57.1%	69	58.0%	69	58.0%
Total	515	235	45.6%	254	49.3%	257	49.9%
Recent Graduation Rates							
1987-88							
Men	945	451	47.7%	616	65.2%	655	69.3%
Women	1234	767	62.2%	915	74.2%	939	76.1%
Total	2179	1218	55.9%	1531	70.3%	1594	73.2%
1988-89							
Men	928	440	47.4%	618	66.6%	647	69.7%
Women	1188	685	57.7%	869	73.2%	898	75.6%
Total	2116	1125	53.2%	1487	70.3%	1545	73.0%
1989-90							
Men	965	481	49.8%	663	68.7%	694	71.9%
Women	1270	777	61.2%	943	74.3%	960	75.6%
Total	2235	1258	56.3%	1606	71.9%	1654	74.0%

Discussion

Three things stand out in looking at the 1920s - 30s graduation data. First, averaging the three 1980s cohorts, the UNH six year graduation rate today is 19 percent higher than an average of the three historical cohorts studied (73.4 percent to 54.4 percent). The four year rate is also higher for the three current cohorts (55.1 percent to 46.9 percent). Certainly on the face of this data, we are doing a better job now than then. Second, women had higher graduation rates than men. This should be no surprise. The fact that women are more likely than men to

finish a bachelor's program has been well documented in national studies by Astin and others. Our data and that of McNeely confirm that historically women were more likely to complete a bachelor's degree. Third, the participation rate for women freshmen at UNH is now double what it was for the cohorts reviewed. At best, for 1929, women represented 28.2 percent of the bachelor's freshmen. In the 1980s cohorts it runs a consistent 56 to 57 percent of the freshman total.

The movement of women into higher education escalated in the twenties. A quick review of University of New Hampshire freshmen classes for percentage of women shows:

Fall 1900	2.4%
Fall 1910	6.6%
Fall 1920	25.0%

In terms of actual counts, UNH went from 1 woman in the 1900 incoming freshmen group to 82 freshmen women in 1920. *The Revolt of Modern Youth* (1925), highlighted the new attitude, "... the Flapper who makes her own living, votes, holds her own in competition with men, refuses to let the corset makers put stays on her, and snaps her fingers at 'styles' dictated by the makers of clothes, is capable of doing things her mother couldn't come within sight of."

Our review touched every year from 1924 to 1937 as we tracked the three cohorts -1924, 1929 and 1931 - through six years. Without getting into detail with socioeconomic or historical aspects, some educated guesses may explain the variation in graduation rates for these cohorts as opposed to the relative consistency for our current cohorts. Simply said, the stock market crashed in October 1929 and, by 1931, the country was heading into the Depression. Compare that, for the 1929 cohort, 45 additional students (9.8 percent) graduated after four and before six years but only 22 additional students (4.3 percent) completed their degrees in the two following years for the 1931 cohort. This likely reflects economic realities as students failed to return for lack of money or to help in a family business or on the farm. A supplementary study by the University of Louisville found an eight percent increase in mortality, tracking the difference in the 1930, 1931 and 1932 cohorts (McNeely, 1938).

The decline in the proportion of female students from almost 27 percent of the freshman cohort of 1924 to 23 percent in 1931 is probably another effect of the Depression. Families with less money were less likely to send daughters to the university. Also the proportion of females of the total graduating within six declined at an ever steeper pace, from 34.2 percent for 1924 to 26.8 for 1931. Women were apparently less able to finish a degree program. It also could be hypothesized that with economic difficulties, opportunities for women diminished, more got married (the old saw of "getting an MRS.") and dropped out. Whatever the reasons, the trend is most vivid in comparing the 66.18 percent

of women graduating within four years for the 1924 cohort (finishing in 1928) with 57.14 percent finishing in four years for the 1931 cohort.

The four year graduation percentage for men, however, actually improved by four to seven percent. Perhaps with the excesses of the Roaring Twenties a thing of the past, those men attending were now more motivated and earnest in their efforts. Freshman enrollment did drop 9.5 percent, from 506 in 1924 to 458 in 1929. The drop for men was 11 percent and for women it was 5.1 percent.

The fortunate circumstance of McNeely using the 1931 freshman cohort enables us to compare UNH results for 1931 with that study. The table following provides percentages of students graduating within four years for selected institutions from McNeely and for UNH.

1931 Freshman Cohort
Percent Graduating in Four Years

Institution	**Men**	**Women**	**Total**
Iowa State College	19.9%	25.5%	21.4%
Massachusetts State College	57.8%	49.4%	55.3%
Pennsylvania State College	53.4%	69.3%	56.0%
University of Wyoming	17.3%	13.7%	15.9%
University of Illinois	25.9%	30.2%	27.1%
Rutgers University	57.5%	58.5%	57.8%
Syracuse University	50.4%	55.6%	52.5%
Washington University	26.5%	39.7%	31.6%
University of New Hampshire	42.2%	57.1%	45.6%

The institutions selected are toward the high end of the McNeely study and/or are most like UNH in type or geographical location. The results show UNH data to be compatible with that study and demonstrate variation by institutional type and location.

Finally, it seems clear that in the 1920s and 1930s if one didn't graduate in the traditional four year cycle one was much less likely to ever finish. Only four to ten percent of the three historical UNH cohorts studied graduated after four years but within six years. For the three 1980s cohorts it ranged from 17 to almost 20 percent of the cohort finishing after four but within six. Certainly in the twenties and thirties a high school diploma was considered a mark of success. Even without graduation, some college was a further enhancement. McNeely observes, "Of the 25 universities [studied], there were 7 which did not report any students continued beyond the 4-year period.... It is evident, therefore, that the universities maintained different policies with respect to encouraging students to continue in the institutions after failing to graduate within the required time. In slightly more

than one-fourth of the institutions, a definite policy apparently prevailed against encouraging students to remain beyond the regular 4-year period. Most of them were privately controlled universities." (McNeely, 1925)

Conclusion

The singular result of this analysis is that the University of New Hampshire produces about 20 percent more graduates in six years for every entering freshman class today than it did in the 1920s and 30s. It also seems, in reviewing the data from the McNeely study, that higher education in general has reduced attrition and improved graduation rates.

McNeely indicates a 31.6 percent average four year graduation rate for the Fall 1931 freshman cohort of twenty-five universities. Recent four year rates are variously reported, depending on institutional grouping, as 34.4 percent for public universities and 69.2 for private universities (Astin, 1996), 27 percent for public institutions and 41 percent for private institutions (CSRDE, 1996) and 29.6 percent for land grant and research universities (Kroc, 1995). Astin's overall rate is 39.9 percent for the 1985 cohort. Citing the rate of 46.7 percent for the 1966 freshman cohort, he states that "... [comparing these] results reinforce[s] the popular conception that degree completion rates in American higher education have been declining." Nevertheless, current rates are largely better than those of sixty or seventy years ago.

We like to believe that higher education has made solid progress in conserving its student resources - in Gavit's words, " . . . the economic waste of the `turnover' and spoilage of material in the business of education." We can do more, but we should take heart that we are making headway. Attrition is an issue of serious concern. We have improved "mortality." Perhaps additional studies by individual institutions and in sequences of decades can further chart our gains and bring greater understanding of changes in graduation rates.

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A SECTOR-WIDE SURVEY OF FACULTY IN PRIVATE HIGHER EDUCATION: ONE STATE'S THOUGHTS ON THE NATURE OF FACULTY WORK AND REWARD SYSTEMS

Michael McGuire and Jason Casey
Pennsylvania Independent College and University Research Center (PICURC)

Introduction

Higher education and its faculty have been closely scrutinized during the past fifteen years. Areas of concern have included the escalating price of a college education; the uncertain skill levels of college graduates and disappointing short-term employment prospects for some; the perception that faculty devote too much of their time to research and graduate programs and too little to teaching undergraduates; mixed messages about the adequacy and allocation of instructional resources; and the belief that faculty are being asked to do too much, spreading their energies across too many activities to the detriment of each one. As Wergin (1994) noted:

> "College faculty in particular have borne the brunt of the criticism. We are sheltered, spoiled folk with cushy jobs, the perception goes; we probably don't work very hard, and if we do, we're more interested in narrow, inaccessible scholarship than in work that addresses society's problems, and we're more interested in specialized graduate education that fits those narrow specialties than we are in teaching undergraduates." (p. 1)

This criticism has not gone unnoticed by policy-makers. Russell (1992) reports on a survey of state higher education executive officers that revealed significant activity in many states to study or implement policies and standards related to faculty workload, tenure, and evaluation. Cahir and colleagues (Pennsylvania State University, 1994) referred to mounting evidence of closer state supervision of higher education in 23 states, and in particular, cited legislative involvement in faculty workload matters in five states. In Pennsylvania, a series of legislative hearings in 1995 led by Representative John Lawless (Marshall, 1995; Moran, 1995) raised serious questions about institutional policies and faculty productivity in the areas of teaching loads, tuition benefits, and sabbatical leaves.

Understanding the Issues: Recent Contributions

Public criticism has spurred significant study of these perceived problems within the academy. This study has taken several forms: essays on conceptualization and methodology, research results, and on-campus roundtable discussions.

The State Policy and College Learning (SPCL) project was initiated by the Education Commission of the States, with primary funding support from The Pew Charitable Trusts. The 1992 report, "An Agenda for Reshaping Faculty Productivity" (Heydinger and Simsek, 1992), emphasized the need to change the current research

paradigm that has dominated the American university landscape in the twentieth century, particularly since the end of World War II. This call to action included an insightful comparison of the professoriate to other professions—physicians, lawyers, and ministers—that further reinforced the inevitability of change within the higher education system that will parallel changes that other professions are already experiencing. Secondary comparisons of the work habits and reward systems of college faculty versus other professions—salespeople, performing artists, professional athletes, police officers, and commercial airline pilots—further supported the notion that higher education is not exempt from the cultural and market forces driving adaptation in other employment sectors:

> "Many industries are delivering significantly more value without commensurate price increases (i.e., electronics, package delivery, fast food). Other industries are increasing their prices but are also delivering more value (i.e., restaurants, specialty tours). All of this is being done with a pace and quality that reflect the changing lifestyles around the globe. People are becoming accustomed to high-quality, quick-response service in which their needs are met." (p. 15)

The authors offer a comprehensive agenda for reshaping faculty productivity that uses incentive schedules to retain flexibility in work definition, reward effectiveness, and require individual accountability.

Another recent volume that contributes both diagnostic and prescriptive information to the debate about faculty productivity is the 1994 publication, "Analyzing Faculty Workload," edited by Jon Wergin. Of special interest are discussions of methodologies for measuring faculty time allocation (Jordan, 1994) and an in-depth case study of faculty productivity measurement at one large research-oriented university (Glazer and Henry, 1994). What becomes clear from reading these papers is that higher education, if so motivated, already has the tools to move the productivity debate to empirical rather than merely philosophical ground. The data that are offered suggest that negative public perceptions are not generally valid: faculty do work long hours, and devote significant time and energy to teaching. In response to the concern that many workload studies rely on self-reported data with little or no objective validation of faculty claims, Jordan notes:

> "... critics of self-report studies suggest that the use of self-reported data leads to inflated workload results. Supporters of self-reported data believe that consistency of responses over long periods of time lends validity to the typical findings that faculty work fifty-two to fifty-seven hours per week." (p. 18)

It is important to remember that criticism of the faculty activity and reward system does not come only from external sources. Several studies have documented faculty dissatisfaction with their compensation, the imbalance between teaching and research in the reward system, and the number and variety of stressors in their jobs (Dey, Ramirez, Korn, and Astin, 1993; Gray, Froh, and Diamond, 1992; Gray, Diamond,

and Adam, 1996; Pennsylvania State University, 1994; National Center for Education Statistics, 1994). It would be inaccurate to assume that faculty are content with the status quo and that only those outside of the academy are clamoring for change.

Nor are many institutions mired in the status quo. In their volume *Recognizing Faculty Work: Reward Systems for the Year 2000*, Diamond and Adam (1993) cite both examples of institutions that have successfully reformed their reward systems and models for understanding and implementing change. There is no shortage of methodologies for improvement; the problems on many campuses seem to be political and cultural.

Recent National Research

The topics of faculty productivity and reward systems cover enormous research territory. Many institutions have conducted workload and productivity studies on their own campuses (see Diamond and Adam, 1993). In addition, at least four major national studies are either ongoing or have recently been completed: the Institutional Priorities and Faculty Rewards Project conducted by the Center for Instructional Development at Syracuse University (Gray, Froh, and Diamond, 1992; Gray, Diamond, and Adam, 1996); the Faculty Survey conducted by the Higher Education Research Institute (Dey, Ramirez, Korn, and Astin, 1993); the National Survey of Postsecondary Faculty (NSOPF88 and NSOPF93) conducted by the U.S. Department of Education (National Center for Education Statistics, 1994); and the National Study of Instructional Costs and Productivity conducted by the University of Delaware (Middaugh, 1996). These studies are summarized in the full 126-page PICURC study report, *Expectations and Experiences of Faculty in the 1990s* (PICURC, 1996).

The PICURC Faculty Survey

To date, there has been significant conceptual work and quantitative research on faculty roles, experiences, perceptions, activities, and reward systems. The higher education community has responded to public concerns with a determined effort to understand the work of its faculty better, to recommend changes to workload and reward systems that may be out of sync with good educational practice and the expectations of key constituencies, including the faculty themselves, and to educate those outside of the academy about the nature and value of <u>all</u> the work that faculty perform. Nonetheless, there continues to be a need for focused research on at least four sets of topics.

1. **Student preparation before and after college**. An underlying premise of higher education and the work of faculty is that students leave college with relevant skills enhanced by their undergraduate experience. Past research (e.g., the NSOPF and HERI studies) has revealed faculty frustration with the quality of students that they have to teach. Periodic reports of declining standardized test scores among college applicants, eroding admission standards at once-selective institutions, and rising freshman attrition rates, further suggest that the level of academic preparation among entering students is often inadequate. On the other end of the undergraduate pipeline, graduating seniors are often perceived as poorly prepared for post-collegiate

life, particularly employment. Anecdotal stories of job placement failures, impoverished twenty- and thirty-something college graduates forced to live at home with their parents, and the occasional functionally illiterate bachelor's degree holder, fuel this cynicism in the public's imagination.

Yet, to what extent are these perceptions valid? Are students taught important things in college? What are their skills upon entering college, and most important, how adequate are the outcomes?

2. **Faculty teaching activities**. In spite of research to the contrary, the belief persists that faculty teach too little and that, when they do teach, they do so in a manner reminiscent of industrial mass production (May, 1996). The PICURC Faculty Survey included a large number of questions—both quantitative and qualitative—on teaching activities to assess both the volume and the nature of those activities. Of special importance were the individualization of instruction, actual teaching loads, use of innovative instructional techniques, and the interplay between research and teaching.

   The conflict or complementarity between teaching and research has been at the forefront of many debates about the value and productivity of higher education. The historical evolution of the American university from an almost exclusively teaching-oriented to a heavily research-oriented institution has been well documented (Heydinger and Simsek, 1992; Diamond and Adam, 1993). Such impassive accounts of "how we got here," however, do little to quell the doubts of consumers and critics whose value systems and self-interest demand a re-ordering of priorities. The vague societal benefits of research, even when substantiated with lengthy lists of beneficial discoveries in such practical fields as health and medicine (e.g., Pennsylvania State University, 1994), are not considered a sufficient excuse for short-changing students and those who help them pay their college bills.

   But are students getting short-changed? That proposition assumes that too little teaching is going on and that research does not add value to the teaching-learning enterprise. The PICURC Faculty Survey attempted to examine these assumptions.

3. **Institutional support of the research and teaching mission.** Past research suggests that faculty have been asked to do too much with too little—too little time, pay, support staff, professional development, and materials. From the faculty's perspective, how valid are these resource concerns, what is their perceived impact, and where are the specific pressure points?

4. **The faculty reward system, real and ideal.** The reward system for granting tenure, promotions, sabbaticals, and annual salary increases has been criticized as imbalanced, unrealistic, and insufficiently student-oriented. Some of the research reviewed earlier examined this topic from a variety of angles. Of primary importance to this study were faculty perceptions of balance within

the current system vis-à-vis an ideal one and the locus of control for determining faculty rewards.

The purpose of the present study was to address these questions specifically for the independent colleges and universities of Pennsylvania, using the previously cited national studies as a backdrop.

Methodology

The PICURC faculty survey was designed by staff of the Research Center in consultation with faculty, administrative colleagues, and consultants, and administered by the participating institutions. The four-page questionnaire, along with cover letters from PICURC and institution presidents explaining the purposes and procedures of the study, were handed or mailed to faculty on each campus. Completed surveys were returned confidentially to PICURC in postage-paid envelopes with a unique sequence code on the envelope for tracking purposes. Faculty who did not return the first survey were sent a second copy with cover letters. A sample of those faculty who did not complete either the original mail survey or the follow-up survey were subsequently called by a professional survey research firm and administered the survey by phone. Data were collected in the fall and winter of 1995-96. All data were analyzed confidentially by the Research Center.

The survey was designed for faculty who had been teaching full-time at their institution for at least three years. Background questions on the survey permitted the Research Center to detect and remove surveys that were inadvertently sent to ineligible faculty (fewer than 5% of the completed surveys were thus removed). This procedure ensured that all respondents had at least a minimum experience base from which to answer the survey questions. The survey had four sections: Students and the Undergraduate Instructional Mission; Teaching and Research Activities; Instructional Resources and Faculty Reward Systems; and background information on respondents.

Institutional Characteristics

A total of fifty colleges and universities participated in the Faculty Survey. These institutions represent 63% of the 79 members of the Association of Independent Colleges and Universities of Pennsylvania who were invited to participate in the study. Over half were Baccalaureate colleges; the second most frequent institution type was Master's colleges and universities. There were four Two-year colleges, three Doctoral or Research universities, and one Religious college. The overall response rate for the survey was 63%, ranging from 34% for the Doctoral and Research universities to 86% for the Religious college. Of the 4,912 eligible faculty in the sample, 2,493 (51%) returned their completed surveys via mail and 579 (12% of original sample, 34% of those contacted by phone) completed the survey by telephone.

Faculty Characteristics
Overall, approximately two-thirds of respondents were male; the median age was 50 years, with a near-normal distribution; almost all (93%) were white; the respondents were well-distributed by rank (36% full professor, 34% associate professor, 27% assistant professor); most (89%) were tenured or on a tenure track; and almost one-fifth were members of a religious order.

Respondents indicated their primary academic department on an open-ended survey question; the responses were then categorized into 14 disciplinary clusters based on the Classification of Instructional Programs. The largest cluster was the social sciences (16%) and the smallest was a multi-interdisciplinary cluster (5%). Multiple specific departments are contained in some clusters, which were employed to reduce the disciplinary groupings to a manageable number with robust numbers of respondents (or Ns).

An examination of the higher education backgrounds of responding faculty revealed that about two-thirds attended private institutions as undergraduates and almost half (48%) attended private institutions for their doctoral studies. Over half (56%) attended liberal arts colleges as undergraduates. Significant numbers pursued their baccalaureate (44%) and doctoral (34%) studies in Pennsylvania. There were sizable differences in the distribution of all faculty characteristics across the different types of institutions.

Survey Results

Notes on Interpretation
Tests of statistical significance were not routinely conducted on the data because the power of such tests, inflated by the large sample size, yielded differences that were statistically significant but trivial in magnitude (see Cohen, 1988). Overreliance on significance tests in the social sciences has recently been called into question (Shea, 1996), further suggesting that they would add little to the largely descriptive analyses presented below. For these reasons, multivariate analyses will not be emphasized in this report.

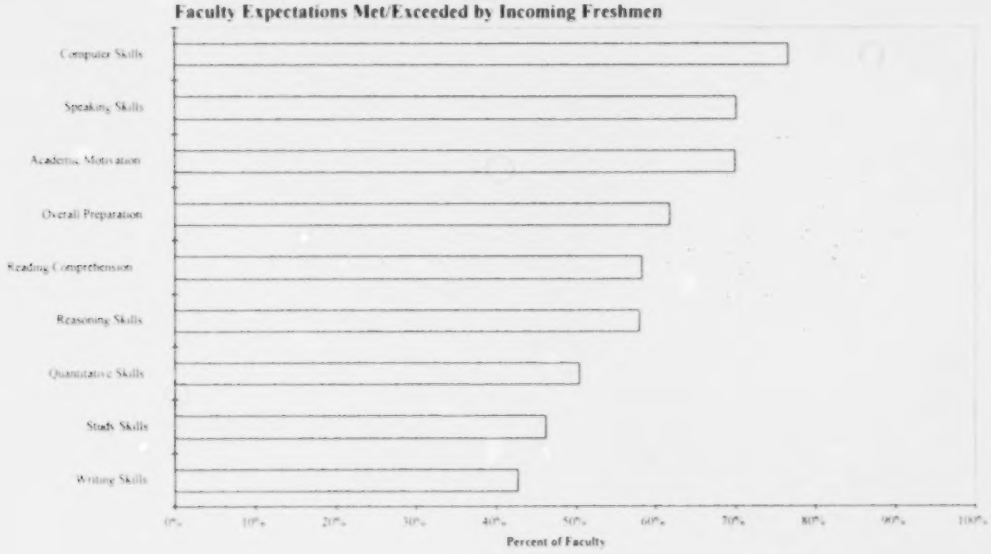
To meet NEAIR brevity requirements, not all of the data collected and analyzed are included in this report. Complete data tables, including meaningful breakouts for each of the major independent variables in the study, are available in *Expectations and Experiences of Faculty in the 1990s* (PICURC, 1996).

Part I: Student Preparation
The first set of questions examined faculty perceptions of the skill levels of incoming freshmen and graduating seniors. These questions were based on the view that students themselves are an instructional resource: those who are well-prepared for college work enrich the instructional setting in ways that underprepared students do not. Student skill levels therefore might be expected to influence the nature and sophistication of the curriculum itself, the approaches and material that faculty bring to their teaching, and ultimately the satisfaction that faculty members derive from

their work. Students who systematically fail to meet faculty expectations can have a dampening effect on the teaching-learning enterprise.

The three skill areas where incoming freshmen were perceived, on average, to be least well prepared were Writing Skills, Study Skills, and Quantitative Skills (Chart A). Fewer than half of the responding faculty had their expectations for Writing and Study Skills met by incoming freshmen. The areas where faculty reported the highest satisfaction were Computer Skills and Speaking Skills. Computer Skills is an area where one might expect generational differences favoring modern student cohorts who have grown up using computers for both academic and recreational activities.

Chart A
Faculty Expectations Met/Exceeded by Incoming Freshmen



Faculty satisfaction with student skill levels was much higher for graduating seniors than for incoming freshmen in all areas (Chart B). Almost 90% of survey respondents claimed that the overall preparation of most graduating seniors met or exceeded faculty expectations and over three-fourths indicated that seniors met or exceeded expectations in all specific skill areas except Writing Skills. The three skills areas where graduating seniors were perceived, on average, to be least well prepared were Writing Skills (72%), Quantitative Skills (77%), and Study Skills (81%)--the same three areas for which incoming freshmen received the lowest ratings. Computer Skills was again the highest-rated area.

Part II: Teaching and Research Activities

The second part of the faculty survey included a series of questions covering both institutional and individual faculty behaviors in the areas of research and teaching activity. The first question asked whether and how the institution actively encourages faculty research. The most frequently cited responses were "Using research productivity as one criterion for granting tenure" (79%), "Providing funds for research" (62%), and "Maintaining a grants/funded activities office" (60%).

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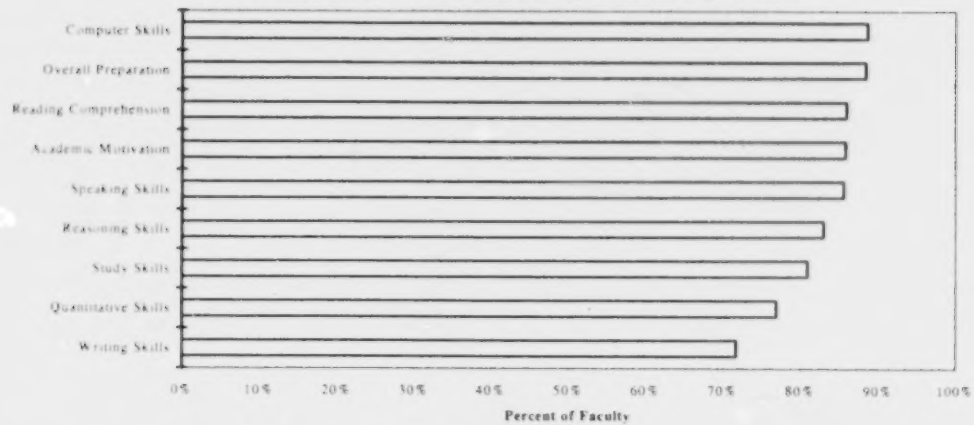
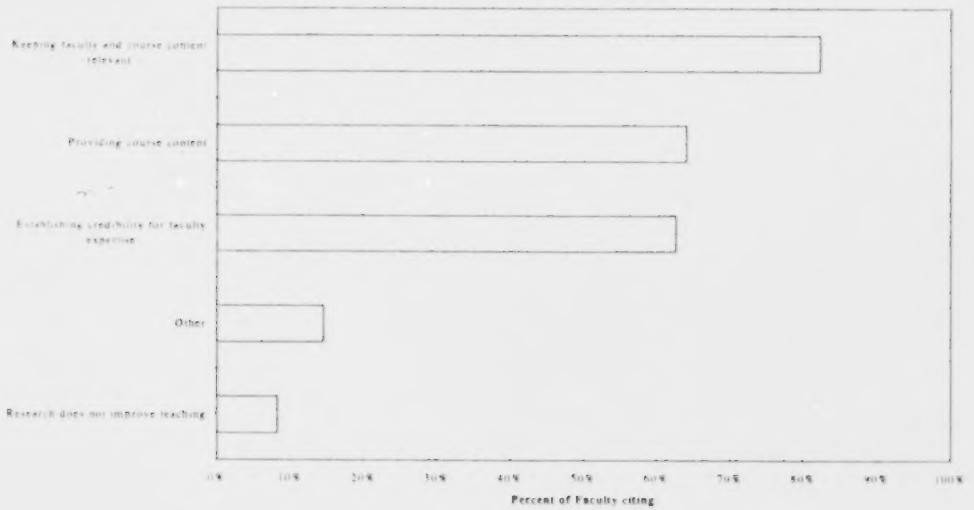
Chart B
Faculty Expectations Met/Exceeded by Graduating Seniors



The second question asked whether and how the respondent involved undergraduates in research. The two most frequently cited methods were "I regularly involve undergraduates as co-researchers" (29%) and "I use undergraduates as subjects in or spectators of my research" (17%). Though less frequently, undergraduates are also permitted to critique faculty research efforts, particularly at Baccalaureate I colleges (17%) and Doctoral and Research universities (11%). The latter institutions had significantly more evidence of undergraduate involvement in faculty research than did the other colleges and universities.

Chart C
Ways that Research Improves Teaching



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In general, the majority (72%) of faculty who do not involve undergraduates in their research teach at institutions that do not actively encourage faculty research.
The third question asked whether and how research improves teaching (Chart C). An overwhelming majority (92%) of respondents indicated that their research improves their teaching in one or more ways: by keeping the faculty member and course content relevant (82%), by providing course content (64%), and by establishing credibility for the faculty member's expertise (63). Significantly, the majority (73%) of faculty who indicated that research does not improve their teaching do not involve undergraduates in their research.

The fourth and fifth questions concerned ways in which faculty members attempt to meet the educational needs of students on the high and low ends of the academic ability spectrum. These items attempted to assess whether faculty individualize their instruction to assist students who do not fall in the middle of the talent distribution. Attention to individual needs is one of the reputed hallmarks of independent higher education, as evidenced by the lower faculty-student ratios and smaller class sizes at many private institutions. The results indicated that the vast majority of faculty employ a variety of strategies to assist high-ability and low-ability students. The most frequently cited strategies for helping high-ability students were "Help them to find mentoring and independent study opportunities" (75%), "Have them tutor other students" (48%), and "Involve them in my research" (37%). Strategies for helping low-ability students included "Refer them to other faculty or qualified staff" (66%) and "Have them tutored by other students" (64%). Only 8% of faculty indicated that they advise high- or low-ability students to transfer to more appropriate institutions, reflecting widespread institutional commitment to student retention and success. Finally, most faculty engage in more than one support activity: 77% % of faculty do two or more things to assist high-ability students, and 73% of faculty do two or more things to assist low-ability students. Only 0.3% of faculty do nothing to assist either high- or low-ability students.

The sixth question examined the issues of diversity, innovation, and cross-fertilization of content and teaching practices across the curriculum. The frequency of faculty responses to each of nine collaborative or otherwise enriching teaching practices is presented in Chart D. The most frequently cited example of cross-fertilization was in course content, where interdisciplinary and multicultural materials/perspectives were relatively common. The next most frequently cited innovative practice was the use of computer technology both in and out of the classroom. Use of portfolios and other nontraditional evaluation measures to assess student achievement was cited somewhat less frequently. Formal team-teaching arrangements were less regularly practiced but far from non-existent. They were more likely to occur for a full term than a partial term, and they were more likely to occur within departments than across departments. Nevertheless, 51% of respondents did some type of team teaching over a two-year period, including 25% across departments. Taken together, these data speak directly to the enrichment and integration of the curricula at large numbers and all types of institutions and the inclination of faculty to break from tradition in terms of both course content and teaching and assessment formats.

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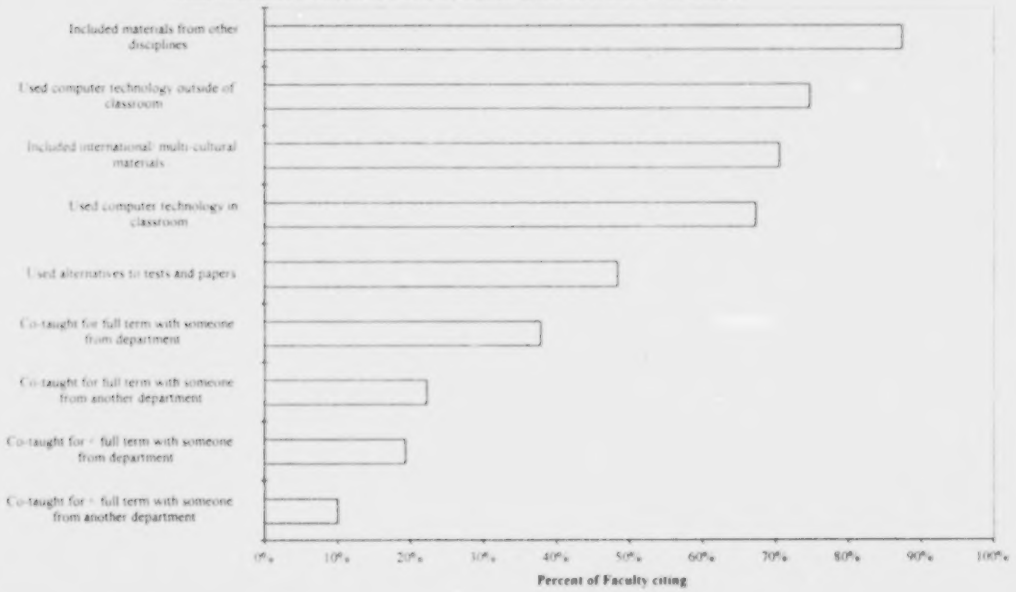
A final question in this section dealt with faculty teaching loads, specifically, the number of sections, independent study students, and credit hours taught by each respondent for three consecutive recent (1994-95) quarters/semesters. The results indicated an average teaching load of between 2.0 and 3.6 lecture sections per semester for those faculty and those semesters when lecture sections were taught; the average for lab/discussion sections was between 1.9 and 3.0 sections per semester and included fewer than half as many faculty in the average. Faculty also averaged between 1.6 and 2.9 independent study students in those semesters they taught independent studies. Refer to the full report for a more complete discussion of teaching loads.

Chart D
Instructional Practices Used at Least Once in Past Two Years



Part III: Instructional Resources

This section included three sets of items. In the first set, faculty were asked to evaluate the adequacy (on a Strongly Agree [+2] to Strongly Disagree [-2] scale) and impact of various instructional resources, broadly defined. Just over half of the faculty (54%) indicated that their institution provided sufficient time and resources for them to be both good teachers and good scholars. Workload demands and budget constraints were felt to greater or lesser degrees by faculty according to their circumstances. The pressures on female faculty (also documented in the HERI survey) and "junior" faculty seemed most acute.

The next item measured faculty perceptions of another instructional resource—students themselves—specifically, how institutional emphasis on students' ability to pay affects student quality. This issue is believed to be an important one in private higher education in the 1990s, a decade that has witnessed both increasing competition for students and budget pressures that have combined to establish ability

to pay as a salient student characteristic at many institutions. Results indicated that fewer than one-third (30%) of responding faculty considered this a concern.

The next two items dealt with the impact of budget constraints—again, a major concern in private higher education in recent years. Just over half of the respondents believed that budget constraints were having significant negative impacts on students' undergraduate experience (53%) and on their own professional experience (58%). For the most part, the negative impact was perceived to be stronger on the faculty's professional experience.

The next set of survey items was directed at faculty who had noted in the previous question the significant negative impact of budget constraints on their professional experience and asked them to specify the nature of this impact in one or more of four areas: on their effectiveness in the classroom or lab, on their effectiveness in other professional settings, on their morale or happiness in the workplace, and/or on other areas. The vast majority of respondents (92%) identified their effectiveness in the classroom or lab as the area of impact; only 17% identified their morale or happiness as the area of impact.

The next questions in this section asked those faculty who perceived a significant negative impact of budget constraints on their professional effectiveness to rank order the importance of specific constraints. In one sense, this question asked those faculty who were most severely affected by budget shortcomings to indicate how they might allocate funds to one of nine areas, in priority order, to remedy the perceived problem. Results indicated that the three highest priorities, in order, were the faculty member's salary, the salaries of other employees and/or staffing levels, and classroom or laboratory equipment and supplies.

Part IV: Faculty Reward Systems

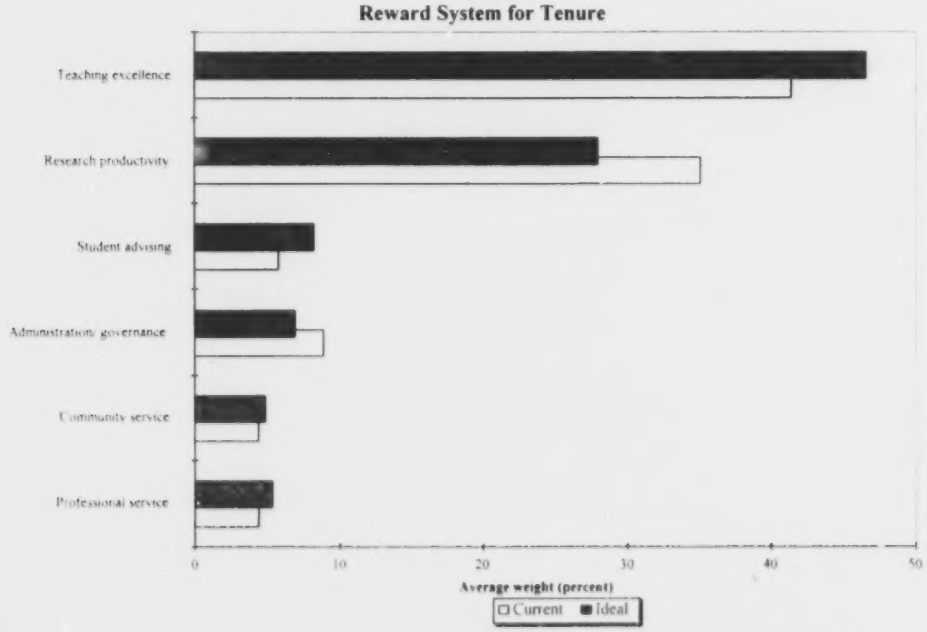
This section of the survey was divided into two parts. The first posed a series of questions about the existence of, and faculty control over, reward systems. The second asked faculty to assign weights (adding to 100%) to each of six components of the reward system: teaching excellence, research productivity, student advising, administrative/governance work, service to the surrounding community, and service to professional organizations. Weights for both the current system on campus and for an ideal reward system, as perceived by faculty, were requested. Weights were assigned separately for tenure and merit pay reward systems. Weights were normalized to total 100% for all responding faculty.

The first question, "There is an appropriate and reasonable faculty reward system in place at this institution," generally evoked mild to severe disagreement among respondents. The second question, "This institution has performance (merit) based salary increases," had widely divergent responses, from mild agreement to extreme disagreement. It is of interest that faculty at the same institution differed in their responses. At one Baccalaureate I college, for example, 49% of respondents agreed with this statement and 51% disagreed with it. While one might imagine this to be an

objective, black-and-white question about whether a merit pay system exists on each campus, in reality it appeared to be a referendum about not only the existence but also the fair implementation of such a system. Token systems that do not consistently achieve their objective of rewarding superior performance appear to be recognized as such and resented by faculty. A third question, "The faculty at this institution have significant control over the nature of the faculty reward system here," evoked almost universal disagreement. Only 7% to 28% of faculty at different types of institutions agreed with this statement. This finding highlights an important perceived problem—the absence or breakdown of shared governance in the definition of the faculty role and the reward systems that reinforce it.

The second set of questions yielded sets of weights for tenure and merit pay systems and differences between the current and ideal reward systems. Major differences among different types of institutions were striking but not unexpected (Note: To conserve space, the charts below represent the response patterns for all faculty combined. The narrative describes the more interesting breakdowns by type of institution.). At one extreme, for the **current** system, Two-year college faculty gave teaching excellence almost two-thirds of the total weight for tenure and over 50% for merit pay; they gave research productivity less than 1% for tenure and less than 2% for merit pay, consistent with the faculty's focus on undergraduate development through teaching and advisement during the first two years of college. At the other extreme, for the **current** system, Doctoral and Research university faculty gave teaching excellence only 25% and research productivity between 56% and

Chart E
Reward System for Tenure



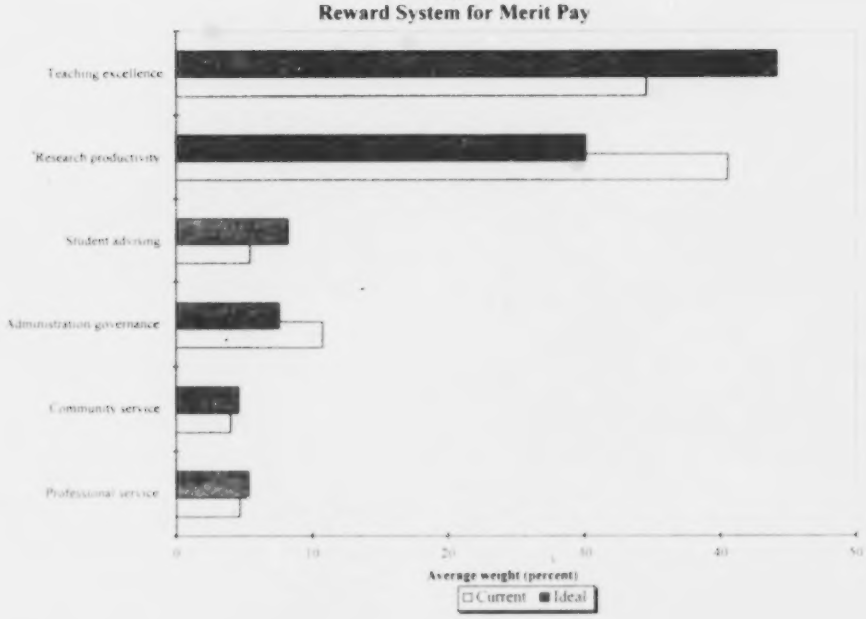
60% of the total weight for tenure and merit pay. It is of interest that faculty at Baccalaureate I and Masters I institutions gave teaching excellence more weight than

research productivity for tenure, but less weight than research productivity for merit pay. Student advising received more weight at Two-year, Baccalaureate II and Masters II colleges than at other types of institutions; in fact, advising received the second highest weight (behind teaching excellence) at Two-year colleges. Service to the surrounding community and to professional organizations received relatively low weights at all types of institutions. Administrative/governance work received higher weights than student advising at all types of institutions except Two-year colleges.

With respect to an **ideal** reward system, for **tenure**, Two-year college faculty shifted weight slightly towards research productivity and service to the surrounding community and professional organizations and slightly away from teaching excellence, student advising, and administrative/ governance work. Doctoral and Research university faculty shifted weights significantly toward teaching excellence, slightly toward student advising and service to the surrounding community and professional organizations, significantly away from research productivity, and slightly away from administrative/governance work. Every weight shifted slightly for all institution types. In general, for all institution types taken together, weights increased slightly from the current to an ideal tenure system for teaching excellence, student advising, and service to the surrounding community and professional organizations; they decreased slightly for research productivity and administrative/governance work.

With respect to an **ideal** reward system, for **merit pay**, the picture changed substantially. Two-year college faculty shifted weights significantly toward teaching excellence and significantly away from student advising. These ideal weights closely resemble the current weights for tenure at Two-year colleges, suggesting a disadvantageous break between the tenure and merit pay reward systems. Significant increases from current to ideal systems were also noted toward teaching excellence and away from research productivity for

Chart F
Reward System for Merit Pay



Baccalaureate I and Doctoral and Research institutions. In general, for all institution types taken together, weights increased significantly from the current to an ideal merit pay system for teaching excellence and increased slightly for student advising and service to the surrounding community and professional organizations; they decreased significantly for research productivity and slightly for administrative/governance work.

Discussion

The results of the present study suggest that faculty at private colleges and universities are actively engaged in significant amounts of teaching that is both pedagogically diverse and sensitive to individual student needs. They also participate in research programs that benefit undergraduates both directly, through collaboration with faculty, and indirectly, through curriculum improvement and faculty development. Instructional resources, particularly in the area of salaries and staffing, are less than ideal and are perceived to be negatively impacting the experiences of faculty and students alike at some institutions. Finally, the current faculty reward system is generally considered to place too little emphasis on teaching excellence and too much on research and governance activities. Faculty do not believe they exercise sufficient influence over the reward systems, a condition that may require serious analysis within the college community if refinement of those systems is desired.

In general, faculty appear to be coping well with a variety of stressors. Conflicting demands to teach and advise students, perform substantial research, participate in the governance of the institution, and perform community and professional service create workload and lifestyle conflicts that are difficult to resolve. Compensation for this

high volume and wide variety of service is not always believed to be commensurate with the quality and quantity of work performed. The effectiveness of the sector's faculty under the difficult budgetary circumstances of this decade, as documented in this and other research, is all the more commendable.

Unfortunately, the resource constraints that higher education has experienced in the 1990s may never abate, at least not in the professional lifetimes of those currently employed. Faculty at many institutions cannot realistically expect large increases in their salaries, staffing levels, and student quality. It is precisely within this context of increasing workload demands and stagnant resources that the notion of resource reallocation and a refinement of the reward system appear not only desirable but imperative if the working conditions of faculty and the educational experience of undergraduates are to improve. The literature reviewed earlier includes examples of the institutional revitalization that has been accomplished elsewhere under similarly trying circumstances.

All colleges and universities should seek out opportunities to maximize the efficiency not only of their faculties but also the systems that define and reward their work. The active and thorough involvement of the faculty will be critical to the success of such reforms. The leadership of the president and senior staff in engaging the academic community to rethink and refine their work and the rewards they receive for performing it will be critical.

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PLACEMENT TEST SCORES AND STUDENT PERSISTENCE: INSTITUTIONAL CONSIDERATIONS FOR ABILITY TO BENEFIT

Alan J. Sturtz
Director, Institutional Research, Planning & Assessment
Gateway Community-Technical College

Introduction

Long before Ability to Benefit (ATB) was a popular Department of Education buzzword, community colleges recognized its value for the large number of educationally "disenfranchised" in their service areas. Currently, however, while ATB may well stand as important as ever, institutional and state-level policy decisions regarding allocation of resources (faculty as well as classrooms) must be made only with hard data: Although a college has an open admissions policy, its individual programs are not precluded from requiring higher academic admission standards; moreover, it appears this tenet can now be applied to pre-college (developmental) courses as well.

The question then becomes, can all students benefit from the courses offered at the community college? The issue raised by this question are as follows: can the college tell potential students that the scores on their required English placement tests[1] indicate that they lack not only the appropriate skills to proceed from a developmental into a college-level English course but also the basic requisite skills to enroll and succeed in most other courses at the college? If not, will sufficient

[1] The college requires all new (first-time at the college), full-time students to take placement tests in English usage/writing, reading and mathematics; part-time and non-degree students who wish to take English or mathematics also must take the placement test(s). The test(s) is waived for any student who has successfully completed college-level English or mathematics at another college or university.

resources be allotted for the college then develop and offer additional **lower**-level pre-college courses to meet these needs; or, with no new resources, will the college cut back on elective courses to address the growing trend of un- and under-preparedness?

Data Analysis

To assess the relationship between the scores on the placement test and success in developmental writing (ENG 100) and also student persistence rates, the director of institutional research, planning and assessment and the coordinator for developmental writing at Gateway Community-Technical College initiated a study of students who took the placement test between 1992 and 1995, who were then recommended to take ENG 100, and who actually enrolled and registered for the course. During this time frame, almost 5,000 students took the English section of the placement test, over 3,000 were recommended for developmental writing and 2,689 actually enrolled in the course.[2]

The key element in the analysis will be the score on the placement test: the hypothesis proposes that students who test below a given level will **not** receive satisfactory grades in English 100 and will subsequently leave the institution.[3] The possible range of scores on the Essay section of the placement test is 0 to 12, with 6 or below a solid recommendation for the developmental writing course (hereafter ENG 100). A score of 7 or 8 is a borderline recommendation for either ENG 100 or the college-level English Composition course, depending on the score on the grammar

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[2] The actual number of students enrolled in ENG 100 since 1992 was 2,866; 163 who enrolled without having the recommendation and 14 students who first enrolled in Fall 1996 were not included in the study.

[3] Other intervening variables, of course, exist that can cause students to leave or to re-enroll in a subsequent semester.

section of the test. A score above 8 is usually a recommendation for the composition course. For the study population, about one-quarter (25.8%) scored 4 or below; 17 percent scored 5, 40 percent scored 6 and 17 percent in the 7 to 8 range. It should be noted that 37 students who had recommendations to enroll in the composition course chose to enroll in the developmental course.

A comparison with the overall college population shows similar numbers by sex (female:male is 57%:43% in ENG 100, 60%:40% overall) but a higher percentage of minority students (African-American 27% in ENG 100, 17% overall; Hispanic 10% in ENG 100, 8% overall; the percentage of Asian-American students is less in ENG 100 than overall--1.6% to 2.9%). Whites are about two-thirds (65%) of the college population but slightly more than half (56%) of the study population.

TABLE 1. Distribution of Test Scores by Sex

	FEMALES		**MALES**	
SCORE	**N**	**%**	**N**	**%**
0-2	32	2.2	58	5.1
3	38	2.5	55	4.8
4	252	16.4	260	22.5
5	245	16.0	209	18.1
6	652	42.6	416	36.0
7	177	11.6	94	8.1
8	119	7.8	57	4.9
9-12	17	1.1	8	0.7
ALL	**1,532**	**57.0**	**1,157**	**43.0**

Looking at the range of scores by sex, 32.4 percent of the males, compared to 21 percent of the females scored 4 or below; 18 percent of the males compared to 16

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percent of the females scored 5 and 36 percent of the males compared to 42.6 percent of the females scored 6. Females had a higher percentage representation in the 7-8 range as well (19.4 % to 13%). By ethnicity, there was almost an even comparison among the four groups scoring 6 or below (83% White, 80% African-American, 83% Hispanic, and 88% Asian-American). At a score of 4 or below the respective percentages are 22.6%, 28.3%, 28.3%, and 73.4%).

TABLE 2. Percent Distribution of Test Scores by Ethnic Group

SCORE	ETHNIC GROUP					
	WHITE	AFRICAN-AMER.	HISPANIC	ASIAN-AMER.	AMER-INDIAN	NO RESP
0-2	2.7	3.6	3.5	13.9	0.0	5.6
3	3.0	4.4	3.8	9.3	0.0	1.6
4	16.9	20.3	21.0	30.2	50.0	28.2
5	17.1	16.2	17.2	18.6	16.7	16.9
6	42.8	36.0	37.4	16.3	33.3	37.1
7	9.2	12.3	11.1	11.6	0.0	5.6
8	7.2	6.5	5.7	0.0	0.0	3.2
9-12	1.2	0.6	0.4	0.0	0.0	1.6
ALL	**56.5**	**27.3**	**9.7**	**1.6**	**0.2**	**4.6**

About 11 percent of the students were enrolled at the college prior to taking the placement test, most of them (6.0%) less than four semesters. Of the remainder,

18.4 percent began during the 1992-93 academic year, 22.7 percent during 1993-94, 28.2 percent during 1994-95 and 20.1 percent during 1995-96. Regarding persistence, of the entire sample, 127 (4.7%) completed degree or certificate requirements and 793 (29.5%) are still enrolled (Fall 1996). These next sections will analyze credits, QPA and length of enrollment in the aggregate and by essay score; all results reflect Fall 1996 enrollment.

Four hundred of the almost 2700 students in the study (14.9%) earned zero academic credits; 43 percent earned 15 credits of less, 22.6 percent earned 16-30 credits, another 8.8% earned 31-45 credits and the remaining 10 percent (287) earned more than 46 credits--including, as mentioned above, the 127 who graduated. An analysis of number of credits earned by test score is shown below.

While it appears obvious that those students with higher scores tend to accumulate more credits--persistence--policy and effectiveness issues must deal with the 15 percent from all score levels accumulating zero credits, the additional nine percent accumulating three credits or less and the 10.5% more with six credits or less.

An analysis of QPA shows that among the population in this study, more than 40 percent (42.8%) had a grade average of less than 2.0 on a four-point scale, about one-third were in the C range and about one in five (23%) had a B or higher. Looking at QPA by essay score confirms the findings of the credit/essay analysis: over 50 percent of those receiving a score equal to or less than 2 had a QPA below 2.0. This same QPA range was found among 56 percent of those scoring a 3 and 50 percent of those scoring a 4. Of those scoring 5, 6 or 8 on the test, 43%, 38% and 31%, respectively, had QPAs below 2.0 Uncharacteristic of this declining trend, almost

half (48.8%) of those scoring 7 had QPAs below 2.0.

TABLE 3. Percent Distribution of Credits Earned by Test Score

SCORE	N	CREDITS EARNED & PERCENT					
		0	1-15	16-30	31-45	>45	# of Grads
0-2	90	23.3	40.0	18.9	7.8	10.0	3
3	93	12.9	52.7	20.5	9.7	4.4	4
4	512	17.6	46.5	21.6	6.1	8.2	15
5	454	16.7	46.2	20.7	9.0	15.3	14
6	1068	12.0	41.9	23.6	9.3	13.4	64
7	271	13.6	39.2	17.9	10.2	12.5	17
8	176	13.6	39.2	24.9	10.2	11.9	9
9-12	25	4.0	40.0	32.0	20.0	4.0	1
ALL	**2689**	**14.9**	**43.4**	**22.2**	**8.8**	**10.7**	**127**

The issue of persistence is examined in a matrix of first-time and last-term enrolled, further refined, as with the other variables, by test score. Of the entire

population, an aggregated 25 percent (678 students) left the college after one term; an additional 16% left after two terms. Perhaps surprisingly, this favorably compares to a one-term attrition rate of almost 40 percent for the college as a whole. On the positive side, 793 students of the original 2,689 (29.5%) are still enrolled in Fall 1996. A profile of the students who left after one term shows a female to male ratio of 56 percent to 44

TABLE 4. Distribution of Test Scores by QPA

	TEST SCORE							
QPA	**0-2**	**3**	**4**	**5**	**6**	**7**	**8**	**9-12**
0.0	21	12	91	76	128	49	24	1
0.10-0.99	4	8	34	23	52	17	3	0
1.00-1.99	19	32	135	96	228	66	27	5
2.00-2.99	32	22	167	160	375	87	67	11
3.00-3.99	14	17	83	94	274	50	53	8
4.00	0	2	2	5	11	2	2	0

percent; 49 percent White, 34 percent African-American, 10 percent Hispanic and two percent Asian-American; about one-third (30.4%) scored 4 or below on the placement test, 70 percent earned three or fewer credits (50% earned zero) and 76 percent had a QPA below 2.0 (60% below 1.0).

Slightly more students are currently enrolled that left after one semester (793 to 678, about 4.5 percent). A profile of these students shows a female to male ratio of 56 percent to 44 percent; 64 percent White, 20 percent African-American, eight percent Hispanic and two percent Asian-American; Twenty-eight percent of this group scored 4 or below on the placement test (another 18.3% scored 5 and an additional 40 percent scored 6). QPA distribution for the persisters shows less than 20 percent below 2.0, 45 percent in the 2.0 to 2.9 range and 35.7 percent over 3.0 (12 students had a perfect 4.0 compared to seven among the leavers). For duration of enrollment, about one-third (31.3%) began their studies at the college more than five semesters ago (Fall 1996 begins their third year); one-fourth began in Fall 1994 and 30 percent began in Fall 1995.

TABLE 5. Two-Term Attrition Rate by Test Score

	TWO-TERM ATTRITION	
TEST SCORE	**N**	**PERCENT**
0-2	37	44.0
3	41	44.1
4	253	49.4
5	200	44.1
6	404	37.8
7	123	45.4
8	68	38.6
9-12	7	28.0
ALL SCORES	**1,133**	**42.4**

Compared with those who left after one semester, there is no difference in the female to male ratio. While about half of those who left after one term where White, almost two-thirds (64%) of those who persisted were White; one-third of first semester leavers were African American, compared to one in five persisters. Percentages for both Hispanic and Asian-American students in the leaver vs. persister groups are similar (10% to 8% and 2% to 2%, respectively). Distribution of test scores showed 30 percent of first-term leavers scoring 4 or lower compared to 28 percent of persisters. Almost half the leavers scored 5 and one-third scored 6 compared, respectively, to 18 percent and 40 percent among the persisters. While 14 percent of persisters scored 7 or higher, about 18 percent of leavers scored 7 or higher. From this analysis, it would appear that there is no difference between the two groups regarding test scores, except in the 5 and 6 score range.

Unlike the baccalaureate institutions, most community colleges do not measure success solely in terms of graduates. While only about half of any years's graduates at Gateway Community-Technical college completed their programs of study in five years or less, only about 10 percent of all enrolled students graduate. Following proposed NCES guidelines, for the first-time full-time degree seeking cohort in fall 1992, 15.2 percent graduated by spring 1995. Only 4.7 percent of students the students who were recommended for ENG 100 in this study graduated: however, over 90 percent graduated in four years (eight semesters) or less--including 16 certificate graduates. The female to male rations was 57 percent to 43 percent, almost identical to the other subgroups analyzed in this study. Whites, African-Americans and Asian-Americans were more highly represented in this population

than in the college as a whole; only Whites and Asian-Americans were more highly represented in the graduate population than in the population recommended for developmental writing. Half the graduates scored 6 on the placement test; 21 percent scored higher. Eleven percent scored 5 on the test and 17 percent scored lower.

Conclusion and Recommendations

While there is no definitive score below which a student will receive an unsatisfactory grade in developmental writing and subsequently leave the college, students scoring 4 or below on the English placement test should be considered higher risk. These students tend to be male (32.4% vs. 21.1% female) and minority (28.8% vs. 22.6% White; with Asian American representation of over 50%). They are more likely to leave the college after one or two semesters without having completed, with a grade of D or higher, any course.

While this analysis should not be the sole factor in determining ability to benefit--or allocation of institutional resources--it does provide vital information for reconsideration of academic policies and support services for strengthened academic advising, alternative modes of instruction, developmental course scheduling, and early intervention programs.

IN SEARCH OF PEER INSTITUTIONS: TWO METHODS OF EXPLORING AND DETERMINING PEER INSTITUTIONS

Bruce P. Szelest
Associate for Institutional Research
State University of New York at Albany

Introduction

The State University of New York (SUNY) at Albany, one of 64 campuses in the state university system, recently undertook an exercise to develop a list of peer institutions that could be used in a system-wide planning processes. The backdrop for this endeavor was the decision of the state university system to undergo a resource allocation review of its campus funding formulae. One component of that review is to identify similar colleges and universities and examine their requisite funding and performance across chosen variables. Peer groups are not necessarily to be used in creating funding algorithms, though, but more so to post facto validate funding patterns that might emerge from collective discussion.

Exactly which variables are to be used as performance or financial measures are not yet formally determined. Our institution was asked to develop a set of peer institutions from which measures could later be compared. Rather than having a specific set of peer institutions externally forced upon us, we were afforded the opportunity to choose our own comparison institutions. We therefore needed to develop a peer institution selection strategy that encompassed a variety of potential variables for later use. This paper outlines the underlying rationale for this undertaking, describes the two analytical methods used, and identifies the peer institutions.

Theoretical Framework

Almost two decades ago, Terenzini et al. (1980) stated that "in recent years, planners, administrators and researchers have increasingly sought improved ways to classify higher educational institutions for descriptive, comparative, and analytical purposes." Sixteen years later we face a similar situation. Teeter and Brinkman (1992) forewarned that funding levels and institutional prestige can be directly or indirectly affected by the use of peer groups. As noted earlier, one of the stated purposes for undertaking this study is to develop a peer group that will certainly be used in the assessment of funding levels and institutional prestige through subsequent performance measures.

There is no one generally accepted standard technique with which to identify peer institutions. Teeter and Brinkman (1992) suggest that in order to ensure success in not only developing a set of peer institutions, but in actually implementing the use of a peer group for comparative purposes, the analyst needs to assess the political environment he or she operates within. A political dynamic can indeed be seen in how comparison groups are viewed. They point out four major types of comparison

groups; 1) competitors, with regard to applicants, faculty, or financial resources, 2) aspirational, those institutions we strive to be like in some respects, 3) predetermined, those institutions that are natural, traditional, or which share jurisdictional area, and 4) peers, which can be used in benchmarking.

SUNY Albany certainly competes for students, more so at the graduate level, with other major public research universities, and to a certain extent, we compete with the other SUNY university centers for undergraduate students and financial resources as well. If a peer group is to be used to assess financial support, it is certainly in our campus's best interests to include some institutions whose level of state support we aspire to emulate. While we would prefer to have the other three SUNY university centers in the comparison group based on a common research mission within the same state system, simply choosing them on a predetermined basis without regard to quantitative analytical justifications would not have most likely been politically acceptable to the system-wide administration, nor, as well, to the other university centers.

Brinkman and Teeter (1987) summarize cluster analysis, hybrid, threshold, and panel review approaches that can be thought of as ranging from purely data driven for cluster analysis, to largely subjective judgment where panel reviews are concerned. This research endeavor, statistically driven with respect to peer institution selection, employed a number of subjective judgments in regard to variable selection, implicit weighting schemes, and also in the handling of missing data. In any analysis, while we may seek objectivity, implicit and explicit subjective judgments ultimately play some role. Hopefully, we can recognize them when they occur.

Dataset Development

As part of ongoing activities, the Albany Office of Institutional Research has over the past several years collected data and sought out sources of information to contribute to a dataset capable of producing institutional profiles across a wide array of variables for use in ad hoc studies and environmental scanning. Data are compiled from IPEDS[1], the National Research Council's (NRC) 1995 report on Doctoral Education, the Chronicle of Higher Education, college guide books, and two soon-to-be published research endeavors.

A dataset was developed that included 104 public Doctoral I and Research I & II universities. A decision was made early in the process to only consider those institutions with a strong emphasis on doctoral education, hence Doctoral II and those institutions that do not offer the doctorate are excluded from analysis. Potential institutions are also restricted to the public ranks due to public control of the SUNY system. While Albany does not have a medical or engineering school, those institutions that do are included in the analysis. It was felt that even though Albany

[1] IPEDS data were obtained from the NSF sponsored CASPAR system developed by Quantum Research Corporation. Visit Quantum's web page www.qrc.com for additional information and access to the CASPAR system.

does not offer medical or engineering curriculums, we are indeed similar to these institutions in other respects. As the analyses will show, several institutions in these categories are indeed identified as potential peers.

Variable Selection

After mission-based narrowing that excluded Doctoral II, Comprehensive, Liberal Arts, Two-year and Professional schools, variables were selected for study based on their appropriateness in capturing dimensions of finance, size, complexity, and quality. The final measures chosen are more heavily biased in favor of financial and quality considerations. Owing to the political considerations cited earlier, fourteen financial, eleven quality, seven size, and six complexity measures were used in the final analysis. It is important to note that individual measures selected for inclusion were made in conjunction with campus decision makers and reflect their concerns.

Several IPEDS financial variables can be considered to address both overall support and more specific expenditure functionality. Total current funds revenue per student and educational and general expenditures per student are used to gauge the overall expenditure patterns at potential peer institutions. Specific expenditure account categories of student services, research, library, and administrative expenditures are also examined on a per student basis. The expenditure accounts of instruction and academic support are combined before conversion to a per student basis out of concern that institutions are more apt to co-mingle or cross-classify these expenditure types. The multi-year average research expenditure per full-time faculty member, published by the National Research Council (NRC), is used as a long term indicator of research expenditures with respect to faculty inputs. Average full-time faculty salaries in 1994, published by The American Association of University Professors (AAUP), are used to represent faculty financial support. Average full professor salary in 1994, also obtained from AAUP, is included in the analysis to provide a measure of financial support for more senior faculty. Because an impetus for conducting interinstitutional comparisons in the first place concerned the allocation of state resources to SUNY campuses, IPEDS sourced state appropriations and non-state support (endowment and gifts) per student measures are included in the analyses. Finally, tuition and fee revenue per student, also obtained from IPEDS, is used to measure the financial aspects of the institution which students are required to contribute to.

Almost half (five of twelve) of the quality measures used are obtained from Graham and Diamond's (1996) doctoral university classification which is grounded in faculty research achievement. Four individual measures of faculty research activity are used. Total publications over a multi-year period, the number of publications per full-time faculty member, the total number of citations in major humanities, social science, and science journals, and the citations per full-time faculty member are used to gauge both overall faculty research activity as well as publishing productivity of an individual institution's faculty. An overall composite of faculty quality, derived from

these measures by Volkwein and Malik (1996) is used as a measure of overall faculty research quality. Average faculty reputational quality is calculated for each institution by computing the mean of each institution's NRC (1995) faculty quality rating for rated programs. Because low student faculty ratios are often looked to as being more amenable to a quality education, a student faculty ratio is computed by dividing IPEDS derived student FTE by the number of full-time faculty reported in IPEDS. More commonly accepted indicators of student quality are the freshmen acceptance rate, percent of freshmen returning for their sophomore year, the six-year graduation rate, and the percent of alumni that contribute to the institution. These measures are taken from U.S. News, one of the major players in the collection and publication of this type of information. Unlike most guidebooks, U.S. News asks institutions to certify their data after initial compilation by U.S. News staff.

The measures of institution size used in this research are those traditionally cited in the literature as being synonymous with defining size in higher education institutions. Total student FTE and headcount enrollment, as well as graduate headcount are used to capture both size and mission. Headcount enrollment is reported by IPEDS and FTE students are calculated by adding full-time headcount and one-third of the part-time headcount enrollment. The total number of all degrees awarded, as well as the number of doctoral degrees awarded are an attempt to measure one aspect of institutional output, graduates, and are also taken from IPEDS. IPEDS also contain the number of full-time faculty in 1994. Finally, the NRC (1995) has published the total number of volumes and serials in each doctoral institution's library.

The five complexity measures address administrative complexity, student body composition, and graduate emphasis. Volkwein and Malik (1996) garnered the total number of deans and vice presidents at each institution from the Higher Education Directory and added them together to form a measure of administrative complexity. The percentage of the student body that is minority is calculated from IPEDS enrollment data, as are the percentage of total enrollment and degrees awarded that are post-baccalaureate. Lastly, the percentage of students living in college dormitories is taken from the College Board survey.

Missing Data

In any undertaking using such disparate data sources missing data is a valid and strong concern. Restricting the potential peer pool to public Research I & II, and Doctoral I institutions reduced the dataset to 104 institutions. Only selected institutions were included in the NRC study of doctoral programs, and fifteen of the public Doctoral I institutions are not included. These fifteen institutions are used in the analysis in determining the percentile ranks discussed below, but are not classified in the peer analyses due to the missing data. Preliminary analyses that did not utilize NRC data failed to group these institutions significantly close enough to Albany to justify the time and effort needed to obtain their data.

Several institutions were found to have missing IPEDS data though. Most often this resulted from FICE code mismatches. Because smaller, more compact database files containing the (alphanumeric) names of each institution were created from each of our major data sources, it was a trivial matter to identify the missing institutions, correct the FICE codes used in matching the files, and update the main database. An exception is the State University of New Jersey which reported all of their 1993 IPEDS financial data for the total system, rather than for each of the respective campuses. In order to include the Rutgers-New Brunswick campus, which Albany views as a potential peer based on its reputation and perceived similarity, seventy-eight percent of the financial figures were imputed to the New Brunswick campus as an estimate based on the fact that seventy-eight percent of the system enrollment was reported for the New Brunswick campus.

Methodology

After considerable preliminary examination of institutions by more conventional schemes such as Carnegie status, the presence or absence of medical or engineering schools, as well as by various demographic and ecological characteristics, two statistical techniques are used to select peer institutions. The rank distance method uses a methodology recently learned from Carol Berthold, University of Maryland System, at the 1996 AIR Forum in Albuquerque, NM[2]. This method is very similar to that used by the University of Kansas and described by Teeter and Christall (1987), but uses a percentile rank order of institutions on each measure rather than Z scores to calculate similarity/dissimilarity. The cluster analysis method uses the outputs of a principal components analysis to group universities into similar clusters. Terenzini et al. (1980) were amongst the early pioneers of this technique at Albany in the late 1970s, and the time seemed ripe to revisit their work in the mid 1990s.

The rank distance method calculates the distance of each public university from Albany using each institution's percentile rank across measures. First, an institution's percentile rank within the dataset is calculated for each measure. Second, for each measure the difference between Albany's (the reference institution) percentile rank and the percentile rank of every other institution is calculated. Third, the differences are squared and summed for each institution. The square-root of the summed distance measure then becomes a composite measure on which each institution's distance from Albany is based. This is a standard Euclidean distance calculation, and the closer each university is to Albany's percentile rank on each variable, the more likely it will be listed as a nearby peer. Each of the thirty-eight measures in the analysis receives equal weight, and complete data is required for each case to calculate a distance score.

The Kansas classification described by Teeter and Christall (1987) utilized a weighting scheme to elevate the importance of certain variables after standardization.

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[2] The author is also indebted to Ms. Berthold for her insights on making use of national databases such as IPEDS and NSF sourced data, as well as for her references to the CASPAR system ,which greatly facilitated this research.

While this analysis does not use explicit weights for the variables chosen, it should be noted that an implicit weighting scheme is active in that fourteen financial, eleven quality, eight size, and five complexity measures are used. Hence, elements of finance and quality are more dominant in assessing institutional similarity/dissimilarity with the reference institution.

The factor and cluster Analysis technique uses principle components analysis (varimax rotation, and Kaiser's criterion for Eigenvalue selection) to reduce the thirty-eight variables to seven factors that reflect dimensions of funding, size, quality, complexity, and research and graduate mission. The factor scores are exported and used in a cluster analysis. Institutional clustering via a dendogram can then be examined to determine how institutions cluster with the reference institution.

Each of the factors receives equal weight in building the clusters, and complete data is required for each university. Once again, a conscious decision was made not to weight the factors, even though no design induced implicit weighting scheme existed. The analysis calculates a standard Euclidean distance measure for each institution based on the standardized factor scores, and uses the "complete linkage" hierarchical agglomerative technique to group institutions into relatively homogeneous clusters. The clusters are formed based on the minimum maximum distance score between institutions, which is compared at each successive step until the researcher decides to stop cluster formation (based on professional judgment about diminishing returns). Each university's cluster can be as small as two campuses, or can be built larger to incorporate larger numbers, depending on the clustering algorithm and the researcher's objective.

The underlying purpose of this analysis is to identify those ten to twenty institutions that group closest to Albany. This is easily accomplished by using a dendogram to trace out Albany's clustering pattern to successive institutions. By definition, similarity between institutions becomes less distinct as the clusters grow. It is also simply a matter of visual inspection to determine where in the clustering process those institutions one may be predisposed to as peers actually enter into Albany's cluster.

Results

Univariate statistics for the thirty-eight measures used are reported in Appendix A. Even though only public doctoral granting universities are included in the analysis, brief review of the means and standard deviations suggests a great deal of variability among them, and further reinforces the need for a comparison strategy. The financial measures exhibited the most variability, followed by the size measures and the quality measures. There was considerably less variation in the complexity measures, suggesting either that this concept may be more difficult to measure or that these universities are indeed more alike in this respect.

The bivariate results reported in the correlation matrix in Appendix B indicate measures, in general, that are highly correlated with each other. For example, total

current funds revenue per student has a pearson's correlation coefficient above 0.50 with every financial measure except for student services expenditures per student (r = 0.33) and average full professor's salary (r = 0.47). Furthermore, it is also highly correlated with percent of enrollment that is graduate, average faculty reputation, the faculty quality measure, total and per faculty publications, and also with citations per faculty member. Other measures were also highly correlated both within and across the hypothetical dimensions of funding, size, quality, and complexity. While more in-depth discussion of these relationships is not entertained here due to space limitations, this does though suggest that a factor analytic technique that controls for possible multicolinearity may be more suitable. Campus decision makers, though, did view the rank distance method as beneficial with respect to evaluating institutions across these measures.

Table 1 below shows the nineteen institutions that have the closest composite rank distance from Albany. Overall, the range of distance scores range from 0 for Albany to 2.88 for the furthest institution, the University of Minnesota (not shown). The overall magnitude of the distance scores is a function the number of measures used. The five closest institutions to Albany are SUNY Binghamton, U Connecticut, U Oregon, SUNY Buffalo, and Georgia Tech. Delaware, UC Santa Barbara, and U South Carolina tie as the next most similar institution with a distance score of 1.70. Campus decision makers can now use this table to examine not only how close institutions are overall to Albany, but they can also see how Albany's percentile rank for different measures compares with those of other institutions. Due to space limitations, columns (1) through (11) in Table 1 only show the institutional percentile rank of selected measures.

Table 1

Albany's Top 20: Rank-Distance Analysis
Percentile Rank within All Public Research I & II, Doctoral I Universities (N=104)

Selected Measures Only

		Financial				Size		Complexity		Quality		
	Composite Rank Distance From Albany	Total Revenue per Student (1)	Instruct & Acad Suppt Expend per Student (2)	State Approp per Student (3)	Avg Full Prof Salary (4)	Student FTE Enroll (5)	Full-time Faculty (6)	Pct Min Students (7)	Pct Grad Enroll (8)	Avg Fac Rep (9)	Grad Rate (10)	Stu/Fac Ratio (11)
SUNY Albany	0.00	34.6	53.9	46.2	90.8	23.1	19.2	73.1	68.3	46.1	86.1	62.5
SUNY Binghamton	1.47	26.9	31.7	51.9	85.4	12.5	6.7	73.1	26.9	21.4	93.8	75.0
U Conn	1.58	48.1	63.5	44.2	92.2	48.1	64.4	41.4	83.7	49.4	80.3	26.0
U Oregon	1.64	29.8	33.7	18.3	36.9	26.9	23.1	36.1	48.1	56.2	51.9	78.0
SUNY Buffalo	1.65	54.8	73.1	85.6	97.1	62.5	59.6	68.9	87.5	53.9	44.2	61.5
Georgia Tech	1.68	77.9	67.3	80.8	77.7	17.3	18.3	76.0	80.8	67.4	80.3	37.5
Delaware	1.70	56.7	70.2	6.7	87.4	41.4	50.0	21.2	8.7	62.9	87.5	46.2
UC Santa Barbara	1.70	42.3	45.2	49.0	94.2	42.3	26.0	89.4	4.8	77.5	77.4	94.2
U So Carolina	1.70	31.7	65.4	48.1	26.2	58.7	62.5	73.1	94.2	36.0	63.5	43.3
Virginia Polytech	1.73	55.8	47.1	42.3	62.1	78.9	87.5	45.7	58.7	58.4	86.1	9.6
UC Santa Cruz	1.74	51.9	64.4	62.5	83.5	8.7	3.9	89.4	2.9	57.3	58.7	80.8
William & Mary	1.76	36.5	52.9	12.5	66.0	3.9	8.7	51.4	76.0	69.7	99.0	3.9
Clemson U	1.79	64.4	34.6	71.2	39.8	26.0	39.4	29.3	41.4	25.8	84.1	30.8
Virginia Commonw	1.79	92.3	82.7	36.5	48.5	34.6	35.1	78.9	78.9	25.8	26.0	51.9
U Rhode Island	1.79	39.4	42.3	22.1	57.8	18.4	21.2	8.2	34.6	23.0	71.2	24.0
Oregon State U	1.81	75.0	56.7	76.9	35.4	21.2	17.3	45.7	45.2	55.1	47.1	58.7
U Mass-Amherst	1.82	65.4	62.5	52.9	65.1	59.6	72.1	36.1	33.7	71.9	73.1	21.2
Washington State	1.83	66.4	69.2	78.9	31.6	38.5	55.3	29.3	13.5	37.6	55.8	26.9
SUNY Stony Brook	1.89	93.3	85.6	94.2	96.1	24.0	40.9	87.5	91.4	78.7	47.1	27.9
U Virginia	1.91	95.2	86.5	33.7	86.4	46.2	57.2	70.2	98.1	87.6	100.0	35.6

With this table, a campus decision maker can see that Albany is in the forty-sixth percentile with respect to state appropriations per student (column 3). The table

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also shows that the other SUNY university centers at Binghamton, Buffalo, and Stony Brook fare better on this measure with percentile ranks of 51.9, 85.6, and 94.2 respectively. It can also be observed that some institutions on this "top 20" list of similar institutions receive even less state appropriations per student than Albany does, such as U Oregon, Delaware, William and Mary, Virgina Commonwealth, U Rhode Island, and U Virginia. Obviously, the Albany administration would rather have their per student state funding more on par with the other SUNY university centers than with the lower funded institutions. While securing more comparable funding within the SUNY system is a political matter beyond the purview of this research, a major advantage offered by the rank distance method is the ability to compare peer group institutions within a broader framework that also includes non-peer institutions.

The second method used to develop a set of peer institutions is a factor and cluster analysis technique. When the thirty-eight measures described above are subjected to principal components analysis, seven dimensions or factors emerge which explain eighty-three percent of the total variance. Table 2 shows the factor loadings and the resulting dimensions.

Table 2

	Size	General Financial	UG Quality	UG Complexity	Graduate Emphasis	Stu/Fac Ratio	Financial Support
Tot FTE enroll	0.98						
Tot degs awarded	0.95						
Full-time faculty	0.93						
Total enroll	0.93						
Numb doct degs awarded	0.87						
Full-time grad students	0.85						
Tot vol & serials in library	0.81						
Numb NRC doct progrs	0.78						
Faculty publications	0.75	0.52					
Fac pubs in most freq journals	0.69	0.47					
Administrative complexity	0.64					-0.43	
Avg fac reputation	0.63	0.49					
Resch exp per student		0.90					
Fed & state grants per student		0.90					
E&G exp per student		0.87					
Resch exp per faculty		0.84					
Tot revenue per student		0.80					
Endow & Gift rev per student		0.73					
Faculty quality composite	0.54	0.69					
Publication per faculty		0.67		0.42			
Instr & acad supt exp per stu		0.66		0.47			
Admin exp per student		0.58					
Citations per faculty		0.55		0.49		0.45	
Six-yr grad rate			0.87				
Frosh retention			0.82				
Pct ug live in dorm			0.77				
Alum give rate			0.60	0.53			
Frosh accept rate			-0.55				
Avg fac salary	0.43		0.45	0.42			
Pct minority students				0.76			
Stu serv exp per student				0.68			
Avg prof sal 1000			0.43	0.55			
Lib exp per student		0.52		0.52			
Pct degs awarded doct					0.93		
Pct grad enrollment					0.79		
Student/faculty ratio						0.75	
Tuition & fee rev per student							0.86
State approp per student		0.54					0.54
Total Variance Explained	43.6%	13.0%	9.1%	6.3%	4.1%	3.6%	3.3%

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These dimensions suggest a further delineation of the four general dimensions hypothesized earlier. The dimensions of size and general finances combine to explain 56.6 percent of the total variance. The fact that faculty quality, publications, citations, and average reputation load on the general financial dimension is an interesting finding, and points out the linkage between financial resources and a quality faculty body. The factor loadings show that the previous notion of quality described earlier can be better defined as undergraduate quality, as the six-year graduation rate, freshmen retention rate, percent of undergraduates living in dorms, and the freshmen acceptance rate are particularly relevant to the undergraduate experience. The percentage of both degrees granted and enrollment that is graduate form a distinct factor of their own, explaining 4.1 percent of the total variance. It is somewhat surprising that the student faculty ratio does not load heavily with any other measures, but by itself, it does explain 3.6 percent of the total variance. Finally, tuition and fee revenue and state appropriations per student form another financial factor that can be characterized as financial support, and distinct from the previous financial factor that is dominated by expenditure measures. Interestingly, state appropriations per student has a negative loading while tuition and fee revenue per student loads positively. This is perhaps indicative of recent experiences in public higher education whereby tuition and fee revenues are increased to offset decreased or stagnant state funding.

Appendix C illustrates the dendogram that graphically depicts the institutional clustering sequence that results when the factor scores are submitted to the clustering algorithm. Of primary interest in this exercise are those institutions that cluster with Albany, the reference institution. Examining the dendogram shows that Albany first clusters with SUNY Binghamton. These two institutions are then joined by William and Mary. This small cluster of three institutions is then joined by a larger cluster composed of SUNY Buffalo, U South Carolina, U Connecticut, SUNY Stony Brook, U Virginia, and UNC Chapel Hill. Finally, Georgia Tech, which has not joined a cluster by this stage, joins the Albany cluster. Institutional clustering can continue all the way to the point when all of the institutions are amalgamated into one large cluster.

For the purposes of this research, cluster formation was stopped at this point, when overall, eight distinct clusters are formed. The nine most similar institutions to Albany noted above are identified as belonging to its peer cluster. Contunued clustering would eventually combine a cluster of eight additional institutions (U Wash., U Minn., U Kentucky, U Cinnci., U Alabama Birm., U Pitt., U Mich. Ann-Arbor, and U Vermont) to the Albany cluster. Other clusters would also combine though, resulting in a four cluster solution. UC San Diego and U Hawaii-Manoa, however, still fail to cluster with other institutions at this point and continue to comprise single institution clusters. While Albany's peer cluster would contain eighteen institutions, the other large cluster would contain sixty-nine institutions. It is felt that inclusion of the additional eight institutions into the peer cluster can not be

justified on the grounds that doing so would unduly reduce homogeneity between clusters, as evidenced by the formation of the extraordinarily large cluster.

What can be said of the peer cluster that contains Albany and nine other institutions though? Five of the ten have medical schools, Albany does not. One land grant institution, U Connecticut, is included, although one does not usually think of U Connecticut as one of the traditional large mid-western land grant universities. Six of the ten institutions are classified as Carnegie Research I, two, including Albany, are Research II, and two are Doctoral I. Table 3 displays these mission characteristics for the peer cluster, as well as for those institutions identified in the rank distance analysis as peers, but which failed to cluster with Albany. The percentile rank of each institution on the seven factor dimensions are also shown.

Table 3

	Distance Analysis (from Albany)	Cluster	Mission: Medical School	Mission: Land-grant	Mission: Carnegie	Factor Score Percentile Rank: Size	General Financial	Quality	Complexity	Graduate	Stu/Fac Ratio	Financial Support
SUNY Albany	---	w/Albany			R2	22 5	27 0	91 0	78 7	93 3	85 4	53 9
SUNY Binghamton	1 47	w/Albany			D1	6 7	11 2	98 9	88 8	77 5	65 2	12 4
William & Mary	1 76	w/Albany			D1	2 3	15 7	100 0	34 8	89 9	30 3	52 8
SUNY Buffalo	1 65	w/Albany	Yes		R1	67 4	40 5	77 5	83 2	95 5	56 2	29 2
U So Carolina	1 70	w/Albany	Yes		R2	62 9	13 5	52 8	42 7	97 8	44 9	60 7
U Conn	1 58	w/Albany		Yes	R1	52 8	19 1	85 4	75 3	85 4	21 4	84 3
SUNY Stony Brook	1 89	w/Albany	Yes		R1	25 8	83 2	70 8	89 9	96 6	43 8	50 6
U Virginia	1 91	w/Albany	Yes		R1	47 2	75 3	97 8	47 2	98 9	53 9	86 5
UNC Chapel Hill	2 23	w/Albany	Yes		R1	61 8	93 3	96 6	58 4	80 9	10 1	3 4
Georgia Tech	1 68	w/Albany			R1	3 4	97 8	95 5	1 1	94 4	74 2	27 0
U Oregon	1 64	3			R2	29 2	34 8	39 3	67 4	56 2	94 4	80 9
Delaware	1 70	2		Yes	R2	36 0	36 0	83 2	73 0	28 1	42 7	96 6
UC Santa Barbara	1 70	2			R1	39 3	46 1	73 0	94 4	3 4	97 8	66 3
Virginia Polytech	1 73	1		Yes	R1	70 8	44 9	88 8	9 0	64 0	28 1	59 6
UC Santa Cruz	1 74	2			R2	9 0	52 8	60 7	96 6	1 1	66 3	78 7
Clemson U	1 79	1		Yes	R2	19 1	55 1	86 5	13 5	53 9	47 2	30 3
Virginia Commonw	1 79	3	Yes		R1	24 7	62 9	14 6	61 8	87 6	48 3	75 3
U Rhode Island	1 79	2			R2	18 0	38 2	48 3	77 5	40 5	34 8	95 5
Oregon State U	1 81	1		Yes	R1	20 2	89 9	37 1	19 1	32 6	69 7	41 6
U Mass-Amherst	1 82	2			R1	69 7	23 6	74 2	80 9	24 7	33 7	93 3
Washington State	1 83	1	Yes	Yes	R2	30 3	76 4	68 5	14 6	11 2	32 6	36 0

As Table 3 illustrates, each institution in the peer cluster, except for UNC Chapel Hill, with a distance analysis score of 2.23 (34 positions away from Albany), were held in the rank distance analysis as potentially peer eligible. The more ethereal factor dimensions, while not as interpretable as the individual measures that compose them, can nonetheless still be evaluated in respect to the percentile rank of individual institutions. The institutions in the peer cluster rank similarly high with respect to quality and graduate education emphasis. Overall, these institutions appear to rank nearer to the median on the student faculty ratio dimension, with Albany and Georgia Tech having the highest percentile ranks. The size, general financial, and financial support dimensions show more variability among institutions in their respective rankings. The complexity dimension, while not as diverse, shows a skewed distribution, with Georgia Tech, noted for its engineering emphasis, having a percentile rank of only 1.1.

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Discussion

In summary, the rank distance and factor and cluster analysis techniques provided an overlapping group of peer institutions for the reference institution, SUNY Albany. In both analyses, campus decision makers played an integral role in developing the list of variables and their respective measures that were used to differentiate institutions. With both techniques, the institutional research staff, as well as higher level campus decision makers, can clearly see how Albany compares to other institutions across financial, size, administrative complexity, graduate study emphasis and quality measures. Increased familiarity with and knowledge about these aspects of our own institution and of our chosen peers is of crucial importance to SUNY Albany in a constrained resource environment.

There are though limitations to these methods. The rank distance method employed did not assign weights to the individual measures. While an implicit weighting scheme was in effect due to the different number of measures used to represent finance, size, quality, and complexity variables, arguments can certainly be made to alter the variable weighting. At Albany, a decision was made to seek peer institutions more closely related on the financial and size variables, and more of those measures were used, precluding the need for weights.

Another limitation of the rank distance method is that basing the distance measure on percentile ranks instead of on factor or standardized scores distorts the magnitudes of the differences between institutions. The percentile rank approach creates a distance measure based on the rank order of institutions for different measures rather than upon the magnitude of their differences from each other. The actual distances in the raw data may be greater or smaller than the distance between ranks.

A final limitation of this methodology worth noting is that many of the measures used, as noted, are highly correlated with each other. In other words, to a certain degree, they may be measuring the same concepts. While the measures used address different concerns campus decision makers harbored, the end result may be confounded by the highly related nature of the measures.

The factor and clustering technique, which alleviates the problem of highly correlated measures by factoring them into seven completely uncorrelated dimensions has an advantage in this respect. In this analysis each of the seven dimensions were equally weighted. A weighting scheme could though be introduced to stress the importance of some dimensions over others if desired.

A well noted limitation of factor analysis is that the factors (dimensions) used for clustering are more difficult to assess. This is particularly true with respect to the percentile ranks used in the first analysis. While standardized factor scores do not easily lend themselves to meaningful interpretation, an institution's percentile rank on

each factor score can be computed to provide an indication of where an institution ranks on particular dimensions, vis a vis other institutions.

Both of these methods provide a means of identifying peer institutions. Neither should be viewed as a turn-key approach. The rationale for the undertaking in the first place plays a significant role in choosing variables and measures of them for consideration. Acceptance of a peer institution group by campus decision makers and relevant external audiences largely depends on accommodating and incorporating their intuition, concerns, and political objectives. The peer review process is a learning process. Through it we learn not only about the funding, quality, or size of other institutions, but more importantly, we learn about how our own institution stands in those respects.

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WEAVING INSTITUTIONAL RESEARCH INTO THE FABRIC OF TQM

Dawn Geronimo Terkla
Executive Director of Institutional Research
Tufts University

Kelli J. Armstrong
Research Analyst
Tufts University

Introduction

As academic institutions continue to look to the business community for models of efficient practice, many universities have adopted the theories behind Total Quality Management (TQM) for both academic and administrative improvements (Manley, 1996). Because the process of TQM necessitates data gathering -- a point where a quality improvement team must examine prior practices and assess current status -- the expertise of an office of institutional research staff is often utilized.

The needs of quality improvement (QI) teams and the practices of an Institutional Research Office may find themselves at odds, however. Data gathering for research projects at most IR offices necessitates systematic planning and careful analysis, yet the time demands of a QI team often do not allow for weeks of research. This paper will examine the impact of improvement techniques like TQM on the resources of an institutional research staff and the approach that has been adopted at a Research I University to reach a compromise between the data needs of QI teams and good research practice.

TQM Methods for Higher Education

In the past decade quality improvement techniques have been widely documented in the field of higher education. Institutions use the techniques to improve specific areas, such as classroom teaching practices and administrative processes, or the quality improvement approaches may be wide-reaching and incorporated as part of an overall assessment process (Sherr and Teeter, 1991; Palmer, 1996).

Although many TQM resource guides provide useful information on how to diagram process problems, translate TQM findings into practice, facilitate TQM groups, or sell the concept of quality improvement to the institution at large, few guides provide details or "maps" on how to gather data to inform the improvement process (Teeter & Lozier, 1993; Ruben, 1995). The reason for the absence of specific material is understandable: each TQM problem (and thus the data needed to address the problem) is unique and therefore requires a distinct approach to the research design and subsequent data collection.

Without some kind of prescription for data collection, however, QI teams may be hindered in their work by this stage of the process. Many teams lack adequate tools to gather the information they need to answer a research question.

Simply enlisting the assistance of an Institutional Research Office can be problematic, though. Most trained researchers have well-defined approaches to the process of gathering and analyzing data. In the carefully dictated time limits for a TQM team to produce a resolution, data gathering must be quick and efficient, with timelines often not conforming to the normal standards used in social science research practice. The following outlines how one institution, through trial and error, worked towards a research compromise for a newly created TQM program on campus.

The Adoption of TQM and the Effect on an IR Office

At a mid-sized research university, Total Quality Management principles were adopted by the senior level administration and techniques were modified to meet specific university goals with the expectation that these tools could be used by all facets of the institution. A TQM steering committee was established to oversee the university-wide TQM effort and to establish the priority by which projects were addressed. The central coordination function for TQM projects was assigned to the Office of Development and Training (ODT). The ODT staff developed the campus-wide TQM protocol for the Quality Improvement teams, involving seven basic process steps. As one of the stages in the standard TQM process required a research component, ODT enlisted the assistance of the Office of Institutional Research for support and to serve as an in-house consultant.

In less than two years, close to twenty Quality Improvement (QI) teams were established to examine a variety of issues including such projects as the scheduling of the budget process, access of orientation information for new employees, and a re-examination of the entire process of pre-health advising for undergraduate students. With the exception of a few early teams, the Office of Institutional Research consulted or managed the research component for all QI teams on campus.

Although Institutional Research staff members had experienced on-campus training in the philosophy and team-based techniques of TQM, the process of managing the research component for QI teams posed a new challenge. Each team had unique needs and a new cast of characters. Overall, the impact on the IR staff was enormous; in a period of less than a year, the project list for the office more than doubled. Typically each team would require the assistance of two members of the IR staff who needed to be present at all relevant meetings and involved in various aspects of survey instrument design, data collection, analysis and presentation.

TQM Teams and IR Difficulties

In addition to managing the volume of new projects, the IR office needed to develop strategies to effectively provide services to QI teams. During the initial period, sometimes it was difficult to easily determine services that were required. Like all new practices, unexpected problems often arose which slowed or hampered a team's progress.

As each newly-formed QI team examined widely different problem statements and outcome goals, the research needs and data requirements of the groups varied

accordingly. In addition, the research background and training of team members were uneven, ranging from those who had little or no experience with data analysis to those who had extensive training in social science or natural science research. The IR office also was placed in the precarious situation of maintaining an advice-giving position, yet not possessing actual membership on the QI teams. When offering research advice and support, it was important not to prescribe the type or form that the research component should take in the TQM process, but rather present alternative strategies and highlight their strengths and weaknesses.

In the course of the first year working with QI teams, the IR office encountered a number of these tangles which fell into several broad categories:

1- Lack of research training/understanding: QI teams were comprised of individuals from a wide variety of backgrounds according to their relationship with the issue at hand. Some teams were fortunate to have members with strong social science or natural science research training, or business marketing training. However, there were other teams that did not have this advantage as their team members had little to no background in the process of gathering and analyzing data.

The university's TQM framework allows 3 to 4 weeks for initial data collection to inform the quality improvement process. Team members with little data collection experience needed to quickly become familiar with a few of the basic research techniques in order to move their QI team to the next stage. Once the data were collected, they also needed additional quick tutoring to assist them in the interpretation of data. For many of the QI teams, developing instruments to gather the data needed to answer research questions proved to be one of the most difficult aspects of the TQM process. Thus, the IR staff was faced with the challenge of providing a broad overview of research methods and analysis techniques.

2- Scope of Problem Not Manageable: On several occasions the IR staff encountered a team who had designed a research problem that was much too large to analyze in its entirety during such a short data collection period. The research required to effectively examine these "large" issues would greatly exceed the typical TQM timeline. Thus, the IR staff needed to help re-focus and narrow the problem to a more measurable research statement.

3- Too many data cooks: Many QI teams determined that the most appropriate method to gather information was through a survey instrument. Several teams attempted to be all-inclusive and circulated drafts of the instruments to each team member, at each draft stage. With the Institutional Research staff coordinating the development of the instrument, on occasion an instrument would be altered a dozen times within a one-week period to respond to the comments of all team members. Given the strict timeline for data collection, this painstaking process proved to be a roadblock towards maintaining the team's schedule. Thus the IR staff was faced with the challenge of making the survey development process inclusive, but not cumbersome.

4- *Political Pitfalls*: Often when IR staff members arrived on the scene to provide support for the research collection stage, they would be unaware of the political undercurrents existing within each individual QI team. Although a particular method of data collection might appear at first glance to be the most efficient, several

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team members might oppose the method due to pre-existing political climates. Issues such as confidentiality and the idiosyncracies of inter-departmental cultures can create barriers regarding the types of questions to be asked and how responses should be collected. Thus the IR staff was faced with how to avoid bending to a particular team's political necessities which could result in the collection of data that could leave many of the research questions still unanswered.

5- Too much data! In addition to the management of instrument design and data collection for the TQM teams, the IR office was often asked to analyze and present the data in a useful form. In an effort to be as helpful as possible, the IR office initially attempted to anticipate every possible question the team might have from the data. Early data reports were quite voluminous, including a multitude of tables and graphs with the hope that if a TQM team had a question about the data, they would be able to find the answer in the report. Unfortunately, many of the teams were overwhelmed by the sheer size of the data report and found that the volume of information actually impeded their process. Thus, the IR staff was faced with the challenge of presenting data in a more "user friendly" form.

Using TQM to Improve TQM Research

In order to accomodate and plan for the burgeoning needs of this new campus-wide endeavor, the IR staff worked with the ODT staff to continually improve their communication and interactions. Regular meeting times between the two staffs were established so that ongoing feedback on successful and less-than-successful practices could be discussed.

One of the policies which emerged from these meetings was that the ODT staff agreed to include Institutional Research staff members earlier in the TQM process, keeping them informed as soon as a TQM proposal was received so that they could plan their resources accordingly. The earlier involvement helped avoid some of the inner QI team political difficulties the IR staff had encountered when it arrived late in the process.

To address the problems of teams requesting too much data analysis or addressing research statements too large for the timeframe, the practice was established of having IR staff members meet with the QI team leader and facilitator prior to e research process to further clarify team needs. The team leader and facilitator also helped establish a QI subcommittee to work on the detailed parts of the data collection and analysis, thereby avoiding the "too many data cooks" problem encountered earlier.

To address the problem of varied research backgrounds of team members, the IR office began its consulting role by composing a "Data Collection Primer"[1] to be included in the TQM manual. In this primer, basic research vocabulary were defined with examples, such as how to develop a research question, the difference between quantitative and qualitative research, and ways to analyze data in order to provide a basic level of understanding about the research process for all TQM team members.

[1]Copies of the "Data Collection Primer" are available upon request.

Members of the IR staff met with the TQM teams to present the primer and to answer early research-related questions. Over time, the Data Collection Primer was modified to become more of a "workbook" so that QI teams would approach the data process better prepared to discuss specific research problem areas.

The Institutional Research Office also changed its usual approach to the presentation of data reports. The data presentations which were most useful to TQM teams were quite different than those completed by the IR office for earlier institutional projects. Generally, the data presentations needed to be simpler, limited only to results relevant to the research problem and presented graphically. Team leaders were also given the option of requesting additional information reports derived from the data, as needed.

Conclusion

In many ways, the interaction of the Institutional Research Office with the TQM endeavor became its own quality improvement process. Over the course of a calendar year, the IR staff continually searched for new ways to serve the various TQM teams on campus, moving from its standard practice of conducting research endeavors using longer-range social science techniques, to an increasingly targeted, market-based approach. The close timeline would often intensify the process; instead of mailing follow-up surveys to increase response rates, for example, telephone calls to survey recipients would be made by team members and IR staff. The basic tenets of TQM -- continous improvement of services to customers and greater efficiency -- were used to help the Institutional Research Office provide better data gathering tools for the TQM team members.

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IR INFLUENCE ON MARKETING AND PRICING POLICIES: FIRST-TIME GRADUATE STUDENT INQUIRIES--WHY DON'T THEY APPLY?

Stephen W. Thorpe
Director of Institutional Research
La Salle University

With increased competition for full-time undergraduate students, institutions of higher education have developed part-time adult undergraduate and graduate programs of study. For one urban, private university, part-time graduate programs were developed with the intention of attracting new markets of adult learners.

Each year, La Salle University receives thousands of inquiries for their part-time graduate programs, and yet very few ultimately apply for admission. The graduate program directors believed that tuition costs were the primary deterrent to increasing applications for admission. The argument was that graduate programs could enroll more students if only the university would lower tuition costs, either by lowering the sticker price or by lowering the net price with financial aid. Other administrators, however, questioned the impact of price on applications compared to non-price issues, including program offerings, convenience, and location. These discussions, which were ongoing for several months, did not seem to be leading to new strategies for graduate student recruitment or program development.

The Director of Institutional Research was invited to assist in efforts to inform decision making regarding marketing and pricing issues for graduate programs. In this role, the Director served as an internal market research consultant to both senior administrators and the graduate directors.

Through initial discussions with administrators, several factors were identified as impacting recruitment of adult graduate students: the institution was not effectively marketing its programs to targeted audiences; tuition prices were higher than the local competition; potential students were not typically eligible for employer reimbursement of tuition; the existing programs might not be aligned with the interests of the public; and the location of the institution was inconvenient to work sites or homes. Upon further discussion, however, it became clear that the demographics of the potential graduate students were unknown, thus making conclusions about their ability to pay, interests in programs, and employment status unclear. Moreover, identification of the competition was problematic since the graduate programs were either general (and therefore several competitors existed in the immediate area) or they were unique to the area and served very specific audiences.

As a result of these initial conversations, the Director of Institutional Research recommended that a survey of inquirers to the graduate programs be conducted.

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Through further consultation with the graduate directors, a Graduate Inquiry Survey was developed.[1] The survey was designed to measure the potential factors identified by the graduate directors as issues affecting recruitment. In addition, the survey instrument sought to identify the competitor schools for each graduate program.

The Graduate Inquiry Survey was mailed to inquirers of eight of the graduate programs at La Salle: Bilingual Studies, Professional Communication, Computer Information Science; Education; Nursing; Pastoral Counseling; Psychology; and Religion. The sample included individuals from Delaware, Pennsylvania, and New Jersey who inquired during the previous year but did not apply for admission.

Table 1
Sample Sizes and Response Rates
by Graduate Program

Graduate Program	Sample Size	Response	Response Rate
Bilingual Studies	179	33	18.4%
Communications	190	39	20.5%
Comp Info Science	190	29	15.2%
Education	182	32	17.6%
Nursing	162	34	21.0%
Pastoral Counseling	167	56	33.5%
Psychology	183	40	21.9%
Religion	129	28	21.7%
Totals	1,382	291	21.0%

The sample consisted of up to 200 inquirers randomly selected for each graduate program. All inquiries were included in the sample for those programs that received fewer than 200 inquiries during the period of study. The selection of 200 inquiries per program was based on budgetary considerations. Two weeks after the initial survey was mailed, a follow-up survey was sent to those inquirers who had not yet responded.

Table 1 shows the response rates by graduate program. From a sample of 1,469 inquiries, 87 surveys were returned as undeliverable. Of the remaining 1,382 individuals, 291 returned a survey, for a response rate of 21%. Although the response rates varied by program, the overall response rate was considered impressive since the respondents had no allegiance to La Salle.

[1] A copy of the survey instrument is available from the author.

Survey Results

One of the important outcomes of the study was to describe the potential graduate student market that was inquiring at La Salle. Table 2 presents several of the results. Nearly 75% of the graduate inquirers said they employed full-time; however, less than half of the inquirers said they were eligible to receive tuition reimbursement for graduate study from their employers.

Table 2
Employment Status and Plans for Graduate Study

	N	%
Employed Full-time?		
Yes	212	75%
No	72	25%
Eligible for employer reimbursement?		
Yes	108	48%
No	98	44%
Not Sure	18	8%
Plans for Graduate School?		
Currently applying at La Salle	5	2%
Applied/Enrolled Elsewhere	89	39%
Plan to Apply at LSU later	76	33%
Decided against graduate school	60	26%

About 40% of the graduate inquirers said they applied or enrolled at another institution after receiving information about La Salle's graduate programs. Surprisingly, another 26% said they decided against graduate school for the near future. These results suggested that the inquiry pool was somewhat "soft" inasmuch as one of every four inquirers ultimately decided not to attend graduate school.

The principal purpose for the study was to determine why individuals do not apply for admission after inquiring about La Salle's graduate programs. The respondents were asked to select from a provided list those reasons that were applicable to their decision not to apply for admission. In addition, the respondents were asked to identify the one reason that was most influential in their decision not to apply. As Table 3 shows, the reasons most often cited for not applying for graduate admission were "tuition too expensive: (29%), "not clear on career goals" (26%), "location" (24%), "job commitments"(22%), and "lack of financial aid" (21%). The reasons identified as most important included "tuition too expensive" (18%), "job commitments" (17%), "program did not meet needs" (11%), and "location" (10%).

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These results suggested that while La Salle was losing a portion of the inquiry pool because of cost, just as many inquirers were not applying for admission because of external forces, such as job commitments and unclear career goals of the inquirers.

Table 3
Reasons for Not Applying for Admission

	N	%
Reasons for Not Applying		
Tuition too expensive	83	29%
Not clear on career goals	74	26%
Location	67	24%
Job commitments	61	22%
Lack of financial aid	59	21%
Family responsibilities	49	17%
Program did not meet needs	43	15%
Prog/specialization not available	39	14%
Total Responses	283	100%
Most Important Reasons		
Tuition too expensive	48	18%
Not clear on career goals	46	17%
Program did not meet needs	31	11%
Location	26	10%
Total Responses	270	100%

In addition to examining the reasons for not applying across all inquirers, Table 4 presents the reasons for not applying for just those inquirers who said they had applied or enrolled elsewhere. Examining this sub-group was especially helpful since these individuals, who represented nearly 40% of the respondents, actually applied or enrolled at another institution which demonstrated their commitment to graduate study.

The reasons most cited for not applying to La Salle for this sub-group included "tuition too expensive" (40%), "location" (34%), and "program did not meet needs" (31%). While tuition expense was cited most often by the overall sample, it was interesting to note that almost as many inquirers in the sub-group cited location and programs not meeting their needs as reasons for not applying to La Salle. In addition, the most important reasons for not applying were equally "tuition too expensive"

(25%) and "program did not meet needs" (22%). To a lesser extent, "location" (12%) was also identified. These results suggested that La Salle was losing potential students because of both cost and program offerings.

Table 4
Reasons for Not Applying for Admission
(Inquiries for Applied/Enrolled Elsewhere)

	N	%
Reasons for Not Applying		
Tuition too expensive	34	40%
Location	29	34%
Program did not meet needs	27	31%
Prog/specialization not available	19	22%
Total Responses	86	100%
Most Important Reasons		
Tuition too expensive	21	25%
Program did not meet needs	19	22%
Location	10	12%
Total Responses	85	100%

For those inquirers who applied or enrolled at another institution, the Graduate Inquiry Survey asked them to identify those features of the graduate program they selected that were more attractive compared to La Salle's graduate program. As Table 5 shows, the primary features identified as attractive about the competition were "program met needs" (62%), "course offerings" (47%), "more appropriate to career goals" (42%), "convenient location" (40%), and "lower cost" (39%). The primary features of the competitor programs identified as most attractive were "program met needs" (29%), "lower cost" (13%), "more appropriate to career goals" (12%), and "convenient location" (8%). These results suggested that tuition pricing alone was not likely to dramatically affect graduate enrollment. Rather, issues of program offerings that are targeted to potential career goals and convenient locations for graduate programs must also be addressed.

In addition to presenting the overall findings of this study to the graduate directors, survey responses were examined by graduate program. These results, not shown in this paper, revealed that the graduate programs attracted student markets that had different needs and priorities. Moreover, issues such as cost or location

affected these groups of potential students differently, which suggested further implications for marketing and pricing.

Table 5
Attractive Features of Competitor Schools
(Inquiries for Applied/Enrolled Elsewhere)

	N	%
Attractive Features		
Program met needs	53	62%
Course offerings	40	47%
More appropriate to career goals	36	42%
Convenient location	34	40%
Lower cost	33	39%
Total Responses	85	100%
Most Attractive Feature		
Program met needs	24	29%
Lower Cost	11	13%
More appropriate to career goals	10	12%
Convenient Location	7	8%
Total Responses	83	100%

In summary, the Survey of Graduate Inquiries provided several findings that directly affect marketing and pricing decisions for part-time graduate programs for this institution: (1) the apparent differences in potential student markets for the graduate programs should be considered in all pricing and marketing discussions; (2) the inquiry pool is relatively "soft"; and (3) while tuition cost was a deterrent for some programs, other issues such as program offerings that meet the needs of potential students and the location (or even convenience) of the university were also very real deterrents for inquirers who did not apply for admission. In addition, this research showed that tuition cost was less of an issue for those inquirers who enrolled at other institutions, again implying that program offerings were deterring potential students more so than cost.

Conclusion

This research project demonstrated the role that institutional researchers can play as internal consultants. In this case, the Office of Institutional Research was pivotal in not only conducting the market research study, but also in informing future policy discussions regarding the factors that impact on the recruitment of adult students for part-time graduate programs.

WHAT DO THE NRC GRADUATE PROGRAM RATINGS MEASURE?

Robert K. Toutkoushian*
Halil Dundar**
William E. Becker***
*Executive Director of Policy Analysis, University System of New Hampshire
**Research Associate, Office of Planning and Analysis, University of Minnesota
***Professor of Economics, Indiana University

INTRODUCTION

Students, faculty, and administrators have long been interested in measuring and understanding the relative reputations of universities and individual programs within these universities. To address this issue, academics have attempted to rate and rank programs particularly at the graduate level (e.g., Hughes 1925, 1934; Keniston 1959; Cartter 1966; Roose and Andersen 1970; Jones, Lindzey, and Coggeshall 1982; Goldberger, Maher, and Flattatu 1995). The results from these studies have often sent administrators and faculty members searching for what the ratings say about the quality of their programs and what can be done to improve them.

Despite the wealth of surveys aimed at measuring program quality, much debate exists within academe as to the validity of these ratings, and even what concepts of "quality" are being measured. To date, most attention (and statistical analyses) has focused on the scholarly quality of faculty as the best measure of reputation. These studies have been criticized by some because they did not address the teaching mission of research universities. The scholarly quality ratings generated by peer assessments have been further criticized on the grounds that they are influenced by "rater bias" (Tan 1986). Such distortions in the ratings may occur if, for example, peers rate programs partially on the basis of where the program is located in addition to what the faculty have accomplished in research and teaching. If ratings are influenced by "non-quality related" factors, then this will limit the extent to which the ratings are a useful guide to participants in the higher education system.

Dating back to the survey by the American Council of Education (ACE), most studies have asked raters to provide separate evaluations of programs based on the "quality of the graduate faculty" and the "effectiveness of the doctoral program". However, it is important to ask whether raters have sufficient information on both the (research) quality of the faculty and the (teaching) effectiveness of the program to make good judgements about each for a large number of programs. For example, in the 1993 survey conducted by the National Research Council (NRC), raters were instructed to consider "the scholarly competence and achievements of the faculty" for measuring scholarly quality (Goldberger et al.; 1995, p.124). However, the list of criteria to be used for evaluating program effectiveness included:

> "The accessibility of the faculty, the curricula, the instructional and research facilities, the quality of graduate students, the performance of graduates, the clarity of stated program objectives and expectations, the appropriateness of program requirements and timetables, the adequacy of graduate advising and mentorship, the commitment of the program in assuring access and promoting

success of students historically underrepresented in graduate education, the quality of associated personnel (post-doctorates, research scientists, et. al.), and other factors that contribute to the effectiveness of the research-doctorate program" (1995, p.124).

Clearly scholarly quality would seem to be easier for raters to evaluate since the research output of faculty is more readily available to individuals outside of the program than the listed aspects on teaching effectiveness. If raters have less knowledge about the teaching effectiveness of individual programs than they do about the scholarly quality of faculty in programs, then raters may simply use their impressions of scholarly quality to make inferences about the program effectiveness in instruction.

This paper summarizes some of our key findings with regard to the factors that influence the scholarly quality and program effectiveness ratings of graduate programs in the 1993 survey sponsored by the National Research Council. A paper containing the complete statistical results from our analysis, including a more thorough discussion of the literature and a comparison of alternative regression models by major groupings of fields, is available upon request. We use multiple regression analysis to examine how previously identified faculty, student, and institutional characteristics influence the recent NRC program ratings of both scholarly quality and program effectiveness, and whether other factors, such as the reputation of the institution and whether the institution is public or private, also affect programmatic ratings.

Our results show that not only are both quality measures very highly correlated with each other, but they are influenced in similar ways by factors such as research output, departmental size, and institutional characteristics. While we found that measures of research output and the size of the program were very important determinants of program ratings, the data also show that the institutional characteristics of where a program is located are also important factors in the program's ratings. Peers tended to rate programs in private institutions higher than those in public institutions, and also rated programs in institutions with many other highly-rated programs higher than similar programs in other institutions.

THE LITERATURE

Several literature reviews exist on the studies that have been conducted pertaining to various measure of academic quality and programmatic ratings (see Tan 1986; Conrad and Blackburn 1986). Early pioneers in the study of academic program ratings include Hughes (1925, 1934) and Keniston (1959), and perhaps the best-known early studies of program ratings were conducted by the American Council on Education, as reported by Cartter (1966) and Roose and Andersen (1970). The National Research Council performed their first study of program reputations in 1982, and in the fall of 1995 released the results from a similar study conducted in 1993. The 1993 NRC study is notable for the large number of faculty used as raters (over 16,700), and have become widely used both within academia and in the popular press as a barometer of the reputation of graduate programs.

There is still considerable debate within academe as to what "quality" is and how it should be measured. Following the reputational studies, a number of researchers have searched for factors that may help to explain the quality ratings of doctoral programs (e.g., Hagstrom 1971; Saunier 1985; Conrad and Blackburn 1985; King and Wolfle 1987; Fairweather 1988; Tan 1992; Ehrenberg and Hurst 1996a, 1996b). These studies varied in the statistical and empirical methodologies employed, the objective measures used to explain ratings, and the survey data analyzed. Since we use multiple regression analysis in this study, it is useful to briefly highlight other studies that have used regression analysis. Hagstrom (1971), using the ACE ratings of programs in four fields, grouped regressors into six categories and estimated separate regression models for each category of regressors. A similar procedure was used by Conrad and Blackburn (1985) to examine the ratings derived from separate program reviews by several teams of external reviewers. By omitting other key independent variables from each regression model, however, these studies cannot identify the partial effects of variables of interest holding other important factors constant.

Morgan, Kearney, and Regens (1976) also used multiple regression analysis to examine the ACE ratings for graduate programs in the humanities, social sciences, natural sciences, and humanities. More recently, Fairweather (1988) applied multiple regression analysis to explain the program ratings from the 1982 NRC study for three fields. Saunier (1985) applied stepwise regression to the program ratings in six fields obtained from the 1982 NRC study. Finally, Ehrenberg and Hurst (1996a, 1996b) used multiple regression analysis to examine the program ratings from the 1993 NRC study. They found that there was a quadratic relationship between faculty size and scholarly quality ratings, and a negative relationship between the dispersion of publications (as measured by the Gini coefficient) and the scholarly quality ratings. However, Ehrenberg and Hurst did not examine whether the scholarly quality ratings were influenced by institutional characteristics. All three of these studies estimated models separately for each field, and focused exclusively on explaining the scholarly quality of faculty.

Taking the correlate and multivariate studies together, over the past three decades studies consistently demonstrated that research output has been one of the most significant variable associated with the reputational ratings of university doctoral programs. They concluded that this is probably due to the fact that they are the primary means of gaining scholarly recognition and reputation. Another consistent finding was that the size of a program was a significant contributor to the reputation of the program.

DATA DESCRIPTION

In this study, we examine the factors influencing programmatic ratings for thirty fields spanning four groupings of fields: (i) biological sciences, (ii) physical sciences and mathematics, (iii) social and behavioral sciences, and (iv) engineering. After eliminating missing values, there were a total of 1,809 programs that we used in the final analysis. We excluded programs from the arts and humanities in this study

because the NRC dataset did not contain information on publications and citations for these fields.

Our analysis is distinctive from other multivariate studies in several respects. First, rather than restrict our analysis to a particular field, we estimate multiple regression models over the pooled sample of fields. The pooling of the data allows us to make more precise estimates of the coefficients for factors in the model than would be possible when estimating models for each separate field. Second, rather than focus exclusively on the scholarly reputation of the faculty rating for each program, we consider two alternative programmatic rating variables, each based on responses from a national sample of faculty in each of the relevant disciplines, in the models that follow. The first variable is the mean scholarly quality rating of the program's faculty, which represents "the scholarly competence and achievements of the faculty" rated on a six-point scale ranging from 0="not sufficient for doctoral study" to 5="distinguished". The second variable is the program effectiveness, which represents "the program effectiveness in educating research scholars and scientists" rated on a six-point scale ranging from 0="not effective" to 5="extremely effective".

EMPIRICAL RESULTS

We began our analysis by using the variables made available by the NRC that have been used by previous researchers to explain scholarly quality ratings. The variables include measures of program characteristics (e.g., publications per faculty), student characteristics (e.g., percentage of graduate students who are teaching assistants), and institutional characteristics (e.g., total library holdings). We also used the concentration of publications or citations within a program, as measured by the Gini coefficients. In addition, we identified several new variables that could potentially influence either measure of programmatic ratings, and may serve as an indicator of rater bias. These three variables are (i) the public versus private status of the institution, (ii) the number of other highly-rated programs within the institution, and (iii) the program's rating from the 1982 NRC study. The first variable tests whether raters give higher or lower ratings to programs located in public universities. The second new variable, which is calculated as the number of programs at the same institution (not counting the program in question) with a scholarly quality rating of 3.5 or higher, can be viewed as a measure of the institution's overall reputation. With this variable, we test the conjecture that peers would rate programs higher if they are located in an institution with more highly-rated programs. Finally, the inclusion of the lagged program rating was designed to identify the degree to which a program's current rating is influenced by its previous rating, holding other factors constant. The means and standard deviations for selected variables are shown in Table 1:

Table 1: Means and Standard Deviations (all fields)

Variable	Mean	Standard Deviation
Scholarly Quality Rating	3.22	0.8
Program Effectiveness Rating	3.18	0.7
Number of Faculty	29.87	21.8
Publications Per Faculty	6.67	4.8
Citations Per Faculty	40.47	59.7
Number Highly-Rated Programs	10.17	10.2
% Public Institutions	70%	---

Correlation of Quality Ratings = +0.96
Number of Programs = 1,809

Note from Table 1 that, as reported in Goldberger et al. (1995), there is an extremely high partial correlation between the two program rating measures that we consider in this study. The independent variables that were included in the particular multiple regression models reported below included the following measures of program, institutional, and student characteristics:

Program Characteristics:
- Number of faculty and number of faculty squared
- Publications per faculty member, 1988 to 1992
- Gini coefficient of publications, 1988 to 1992
- % of faculty who are Full Professors
- % of faculty with research support, 1986 to 1992
- Twenty-Nine dummy (0-1) variables for field

Institutional Characteristics:
- Public or private institution
- Number of highly-rated programs
- Total library volumes (in 10,000s)
- Total research and development expenditures (in $10,000s)

Student Characteristics:
- % students holding graduate or research assistantships
- % students holding teaching assistantships
- Ratio of graduate students to faculty
- Median years to completion of doctorate degree

Most of the variables listed above are self-explanatory, with the exception of the Gini coefficient. In this application, the Gini coefficient is a measure of the dispersion of publications across faculty within a program. As the Gini coefficient becomes larger, the publications within a program are said to be more concentrated among a few faculty, and vice-versa. Ehrenberg and Hurst (1996b) show that there is a negative relationship between the Gini coefficient and the scholarly quality rating of faculty, implying that programs with a more even distribution of publications across faculty will have higher scholarly quality ratings, holding all else constant.

In Table 2, we summarize the results from two of the regression models that we estimated explaining how these and other factors influence either the scholarly quality rating of programs and the program effectiveness ratings using the pooled sample. It should also be noted that we corrected the standard errors in all of the regression models for the presence of heteroscedasticity.

Table 2: Effects of Selected Variables on the Scholarly Quality Rating and Program Effectiveness Rating From the 1993 NRC Survey

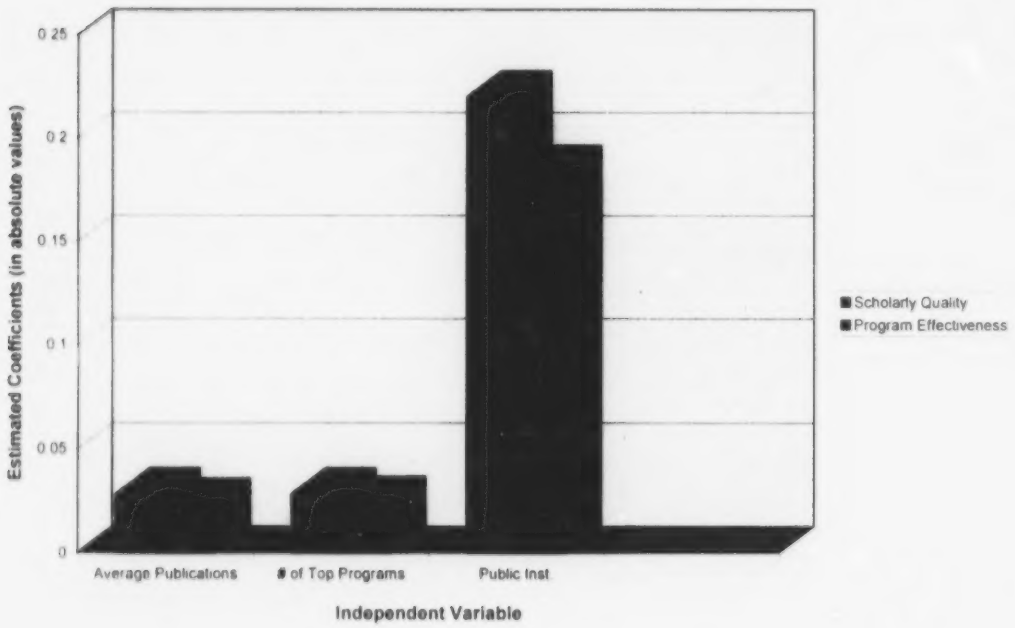
Variable	Effect on Scholarly Quality Rating	Effect on Program Effectiveness Rating
Historically-Important Factors		
Publications Per Faculty	+0.03	+0.02
Number of Faculty	+0.02	+0.02
(Number of Faculty)^2/1000	-0.09	-0.08
New Variables		
Number of Highly-Rated Programs	+0.03	+0.02
Public Institution (1=yes, 0=no)	-0.22	-0.18
R-Squared	+0.75	+0.71

All of the estimated coefficients shown in Table 2 were statistically significant at the 1% significance level. Collectively, it can be seen that the independent variables used in our regression model account for approximately three-fourths of the total variations in program ratings across institutions.

The results for the scholarly quality ratings measure were consistent with the existing literature, and what one might expect to find a priori. We found that programs with higher average publication rates tended to have higher predicted scholarly quality ratings, and as shown by Ehrenberg and Hurst, that the size of a program has a strong (quadratic) effect on scholarly quality ratings, holding the other variables in the model constant.

Interestingly, we found that these and other factors not only had the same directional effect on the program effectiveness ratings, but also had very similar point estimates as well. For example, if the faculty in a particular program were to publish one more article on average for the entire five-year period, this would raise both their predicted scholarly quality rating and program effectiveness rating by 0.03, again holding all else constant. This similarity is shown graphically in the chart below:

Effects of Selected Variables on Alternative NRC Quality Measures



We found much the same story when we looked at the results for the new variables that we identified in our analysis. With regard to the institution-specific measures that we added to the regression model, the data suggest that raters would assign lower ratings to programs when they were housed in public versus private institutions. Furthermore, if a program was in an institution with many highly-rated programs, raters tended to assign higher ratings to that program, independent of other factors that should influence ratings such as publication and citation rates of faculty. This is consistent with Fairweather's (1988) suggestion that overall institutional quality or prestige plays a significant role in influencing a program's perceived quality. Once again, these institutional characteristics had very similar effects on the program effectiveness ratings as well.

Finally, to determine the extent to which current program ratings are driven by previous ratings, we reestimated the multiple regression model shown above after including an additional regressor for the mean program rating from the 1982 NRC study. Due to the presence of missing values for these variables, the sample sizes in the regression models were smaller than those shown above (n=1,020 and 1,016 for scholarly quality and program effectiveness, respectively). We found that there was evidence of a strong positive relationship between a program's current scholarly quality rating and its rating in the previous NRC study from 1982. This suggests that there is considerable inertia in current reputation measures, in that the reputations of programs take time to evolve and change. The same result applies to the program effectiveness rating. Nonetheless, it is interesting to observe that all of the key factors

were still highly significant predictors of the current scholarly quality and program effectiveness ratings, even when holding constant each program's previous rating.

SUMMARY

In this study, we have summarized the results from our analysis of the programmatic ratings -- both for the scholarly quality of faculty and program effectiveness in educating scientists -- derived by the 1993 NRC survey using multiple regression analysis. We found that both reputational ratings are influenced by the same set of faculty, student, and institutional characteristics, and are highly correlated with each other. Thus, as a general barometer of a program's reputation or quality, each of these measures should yield similar insight and rankings.

The similarity between the two ratings raises the question of whether students, faculty, and administrators can gain more insight into the quality of a particular program by considering the program effectiveness rating in addition to the scholarly quality rating. Our results suggest that in the aggregate there is little "value added" from the program effectiveness measure. There are two possible explanations for our findings. First, scholarly quality and program effectiveness, while being two separate concepts, are influenced in similar ways by the same set of factors. Under this scenario, raters have good information on both concepts for a wide variety of programs in their field, but the two measures tend to go hand-in-hand; whatever has positive benefits for the perceived scholarly quality of faculty likewise has positive benefits for the program's ability to train young researchers, and vice-versa.

The second possibility is that raters, having poor information on the ability of various programs to train young researchers, use their impressions of the scholarly quality of faculty to make judgements on the former construct. In this case, the two measures — scholarly quality and program effectiveness — essentially represent the same concept. If this is true, then perhaps alternative means should be developed for securing information on the teaching effectiveness of academic programs.

Our results also offer some constructive ideas on how a program might strive to improve their mean rating, and in the process, their relative rank within their field. We have demonstrated that although the program ratings from the NRC study are computed from subjective rater opinions, those opinions appear on average to be effective at representing the visibility of research output of a program's faculty. Therefore, changes within a program that would lead to increased visibility should eventually have an impact on the program's rating. For example, initiatives that would lead to an increase of, say, one publication per faculty member per year, would be predicted to lead to an increase in the mean ratings of approximately 0.15. Such a change might be sufficient to move a program up several places in the ratings over time.

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ADMINISTRATIVE SATISFACTION AND THE REGULATORY CLIMATE AT PUBLIC UNIVERSITIES

James Fredericks Volkwein
Director of Institutional Research
and Associate Professor of Educational Administration and Policy Studies
University at Albany
Albany, NY 12222
(518) 442-5413
E-Mail: Volkwein@Albany.edu

Shaukat M. Malik
University at Albany

Michelle Napierski-Prancl
University at Albany

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ABSTRACT

To what extent do regulatory climate differences among states influence the satisfaction levels of campus managers? This study first measures the financial, personnel and academic dimensions of state regulation, and examines the extent to which university and state characteristics have an effect on the regulatory climate and administrative flexibility granted to campuses. Second, the research analyzes the dimensions of managerial satisfaction and tests the hypothesis that the state's regulatory climate exercises an influence on the satisfaction levels of managers who are in functional areas impacted by state control. An array of organizational, individual, and work climate variables are used as controls. An atmosphere of administrative teamwork and interpersonal stress appear to exert the strongest positive and negative influences on administrative satisfaction.

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ADMINISTRATIVE SATISFACTION AND THE REGULATORY CLIMATE AT PUBLIC UNIVERSITIES

The Research and Policy Problem

While demands for accountability and control have produced, over the past 30 years, an increase in governmental regulation, the more recent atmosphere in Washington, D.C. and several state capitals reflects a growing consensus that regulation can be both costly and unproductive. "Taken by itself, any single action may not be unbearably intrusive, but the combined impact of many actions can nearly suffocate an institution" (Carnegie Foundation, 1982, p. 65).

Most organizational behaviorists believe that an increase in monitoring activity increases operating costs, both for those doing the monitoring and for those being monitored (Downs 1967). Many authors in higher education condemn regulations that hamper an institution from adjusting to changing circumstances and needs. A number of publications by the Association of Governing Boards (Gardner, et al., 1985), the Carnegie Foundation for the Advancement of Teaching (1982), the Carnegie Council on Policies Studies in Higher Education (1976), the Carnegie Commission on Higher education (1973), and the Sloan Commission (1980) have agreed that over-regulation is wasteful.

The Carnegie Commission (1973) concluded that campus autonomy has declined substantially since the end of World War II. For the nation as a whole, state legislative enactments per year increased from roughly 15,000 in the 1950s to 50,000 annually in the 1980s (Fisher 1988). While not all of these bills affect higher education, Fisher examined four representative states and found that nearly half of the higher education laws in this century had been enacted in the most recent two decades. However, the nature and intensity of these measures differ from state to state due to the varying nature of state history, structure, culture, law, educational standards, and political tradition. In heavily regulated environments, public universities are treated like "state agencies" and have less flexibility in personnel, financial and academic matters. Campuses in other states are relatively autonomous, and considered to be "state aided" (Curry & Fisher 1986).

The 1982 study by the Carnegie Foundation reported that state officials fail to reward efficient leaders, and that campus managers feel caught in a bureaucratic web that demands accountability, but provides few incentives for responsible management. Administrative dissatisfaction with over-regulation is worth examining because the job satisfaction literature indicates a strong connection between satisfaction and productivity (Vroom 1964, Porter and Lawler 1968).

Much has been written about government regulation of public higher education, but there are few empirical studies that analyzed the relationship of state regulation to various campus and state characteristics except Volkwein's National studies in the 1980s,

and more recently in the 1990s (Volkwein 1986, 1987, 1989; Volkwein & Malik 1996, 1997). While these studies found little relationship between measures of regulation/autonomy and other university characteristics and behaviors, they offered the hypothesis that state controls have a negative impact on administrative satisfaction. No studies in higher education have attempted to measure the impact of state regulation on administrators job satisfaction, despite the linkages in the research literature among satisfaction, performance, stress, and turnover (Austin & Gamson 1983, Glick 1992, Hagedorn 1996, Smart 1990). Researchers have shown a consistent inverse relationship between worker job satisfaction and turnover rates (Cotton & Tuttle 1986, Glick 1992, Mobley et al. 1979, Smart 1990).

Thus, there are multiple reasons to be concerned about state regulation and campus autonomy. First, the empirical literature on state regulation and its impact on campuses is sparse. Second, unless its benefits can be demonstrated, regulatory activity by the state appears to be unproductive and wasteful of taxpayer resources. Third, regulatory activity may reduce managerial job satisfaction which in turn increases turnover and lowers organizational productivity and adaptation. Since educational institutions, along with the rest of society, need to become more productive, we need to remove as many obstacles to increased productivity as possible. Since the States as well as the Federal government provide much financial support to this large higher education industry, they have a stake in knowing the impact of regulatory actions.

Purpose of the Study and Conceptual Framework

To what extent do regulatory climate differences among states influence the satisfaction levels of campus managers? This study addresses this question first by measuring the administrative and academic dimensions of state regulation, and examining the extent to which university and state characteristics have an impact on the regulatory climate. Second, the research examines the perceived work environments and individual characteristics of administrative managers whose positions are impacted by state control. With responses from almost 1000 managers at 100 universities, we analyze the dimensions of managerial satisfaction and test the hypothesis that the state's regulatory climate exercises an influence on satisfaction levels. We conducted this study by merging a variety of theoretical perspectives from the research literature: organizational theory, structural/functional perspectives, the literature on university autonomy, and theories of employee satisfaction.

Contemporary organization theory stresses the role of the organization's environment as a crucial influence on the life of an organization, its structure, and its activities. Contingency theory (Lawrence and Lorsch, 1967), the natural selection model (Aldrich, 1979), and the resource dependence model (Pfeffer and Salancik, 1978) all focus on the **external environment**. Volkwein (1986, 1989) found support for the resource dependence model in his studies of university quality. Public universities are viewed as complex, loosely-coupled organizations, and their relations with state

governments form a critical component of the external climate within which they pursue their goals. Scholars generally divide an organization's environment into economic, political, social, and technological dimensions.

Structural/functional perspectives from the literature on organizations and bureaucracies encourage researchers to attend to those variables that reflect the influence of organizational structures (Hall, 1991). Studies of colleges and universities, as particular types of organizations, have shown that campus mission, size, wealth, and selectivity exert significant influences (ranging from small to large) on a variety of college outcomes (Pascarella and Terenzini, 1991). Volkwein (1986, 1989, 1995) has demonstrated that a variety of university characteristics tend to cluster together along the dimensions of mission, size, financial support, and complexity. In their summary of the research literature, Austin and Gamson (1983) call for the incorporation of such factors as institution size, control, and selectivity into future studies of administrative satisfaction. Hagedorn (1994) notes the importance of university and department quality as influences on satisfaction.

The literature on **university autonomy and state control** suggests that there are multiple dimensions. Berdahl (1971) distinguishes between "procedural" and "substantive" autonomy. Levy (1980) and the Carnegie Foundation (1982) identify three important areas of university autonomy: financial or budgetary, personnel or appointive, and academic. In his studies of state regulation and campus flexibility, Volkwein (1986, 1987, 1997) found that the financial and personnel dimensions collapsed into a single administrative factor, leaving academic and administrative as the two autonomy dimensions.

The **job satisfaction literature** provides several conceptual frameworks that guide the development of this study and its measures. Maslow's hierarchy of needs is used by most management experts to argue in favor of worker autonomy and organizational flexibility (Boons & Kurtz, 1992). Herzberg's Two Factor Theory (1959) draws our attention on the one hand to intrinsic job content factors (such as feelings of accomplishment, recognition, and autonomy), and on the other hand to extrinsic job context factors (such as pay, security, and physical working conditions).

For instance, several researchers have identified the opportunity for independent thought and action, feelings of accomplishment, opportunities of growth and development, and self-esteem as indicators of intrinsic rewards (Olsen, 1993; Austin and Gamson 1993; Hackman and Lawler, 1971). On the extrinsic dimension, Kalleberg (1977) demonstrates that job satisfaction is positively affected by job reward factors such as pay. Hagedorn's (1994) causal model of satisfaction in academe shows satisfaction with salary, total work hours, and perceived support of colleagues as directly influencing perceived level of stress which, in turn, directly effects satisfaction. At any rate, there is general agreement that job satisfaction is multi-dimensional and influenced by a complex array of personal and situational circumstances (Austin & Gamson, 1983; Hoppock, 1977; Mumford, 1972; Bruce and Blackburn, 1992).

Consistent with research in other organizations, studies of managers in colleges and universities suggest that a variety of personal and organizational variables exert potential influences on their job satisfaction. Among these personal characteristics are age (Austin, 1985; Lee & Wilbur, 1985; Solomon & Tierney, 1977), sex (Austin 1985; Hagedorn 1996), level of education (Martin and Shehan 1989), length of service (Bamundo & Kopelman 1980), administrative rank (Austin 1984), and administrative area (Glick, 1992).

The organizational characteristics that may influence managerial satisfaction include organizational mission, size, wealth, complexity, and quality (Austin & Gamson 1983, Hall 1995). Several studies also show that a variety of work related variables exert positive and significant influences administrative satisfaction -- a supportive organizational culture, teamwork, relationships with colleagues and superiors, worker autonomy, and self-fulfillment (Berwick 1992, Bensimon & Newman 1991, Austin & Gamson 1983, Boone 1987, Lawler 1986, Rigg 1992).

Negative influences on satisfaction are produced by job and workload stress (Blix & Lee 1991, Glick 1992, Olsen 1993). Because of the connection between the two, job stress variables are almost always included in studies of job satisfaction (Blau 1981, Hagedorn 1996). Moreover, there are multiple sources of stress related to roles and responsibilities, tasks and workload, social and interpersonal relations, and personal health (Blix & Lee 1991, Smith et al. 1995, Sullivan & Bhagat 1992). Thus, in this study we control for the influences of outside stresses like personal and family health problems, personal and family financial problems, and interpersonal difficulties with colleagues and superiors. Many in higher education argue that the regulatory climate influences the satisfaction levels of campus managers and over regulation produces a controlled work environment (Atwell 1985, Carnegie Foundation 1982, Curry & Fisher 1986, Mingle 1983, Newman 1987). Solomon and Tierney (1977) and Smart and Morstain (198) found higher satisfaction among college administrators reporting a work environment that is appealing and challenging and consistent with their preferred responsibilities. Thus, we complemented our measures of actual state control with measures of the perceived regulatory control and work environment.

Research Methods

We created the analytical database for this study drawing information from a wide range of different sources. Information on state characteristics was assembled from U.S. Census data, the public administration literature, and a survey of state regulation and management flexibility practices. The organizational and financial characteristics of universities came from NCES/IPEDS, from the National Research Council study of doctoral programs(1995), from the Graham and Diamond research at Vanderbilt (1996), and from the guidebook information contained in *Barron's* and *US News*. The information about the backgrounds, perceptions, personal stress, and satisfaction levels of individual administrators was obtained on a survey that was administered by cooperating

campus officials to a population of managers with 12 specific job titles that we hypothesized would be impacted by state control and campus flexibility.

Target Population, Data Sources, & Variable Summary

This study solicited responses from 144 public universities in the United States classified by the Carnegie Foundation as Research I & II or Doctoral I & II. 122 universities in 50 states agreed to participate in the study, and their Presidents and Chancellors designated a campus contact person to assist the researchers with data collection. Each campus received two types of surveys. The first survey (of management flexibility and state regulation) contains 47 questions about financial, personnel, and academic transactions. This first survey was returned by 122 public universities.

The second survey of administrative satisfaction and stress was administered to 12 managers (ranging from vice presidents to directors) on each campus who hold positions that in theory are effected by the regulatory climate. This second survey contains 7 questions about the respondent's background, and 44 items assessing their satisfaction, stress, and working conditions. Using procedures to ensure respondent anonymity, we eventually received 995 satisfaction surveys from 100 cooperating universities. The number of administrative respondents by rank and functional area is shown on the following page. While not every campus had all 12 managerial titles, we received an average of 10 satisfaction surveys per campus.

The attached diagram of variables in this study shows the measures that we assembled from these various sources. A more complete description of the methodology and data reduction steps for the state attributes, campus characteristics, and measures of regulation and flexibility is contained in Volkwein and Malik (1997, forthcoming).

State attributes: We incorporated into the database thirty-seven state characteristics that fall into three broad types of measures: economic (e.g., per-capita income, tax capacity, support for higher education, poverty rate), social/demographic (e.g., population attributes, mobility, ethnic and age profiles, education levels), and political/bureaucratic (e.g., relative size of state government, governor's power, political culture, voting patterns). State characteristics data were obtained from NCES "State Higher Education Profiles," from U.S. Census Data, from the Center for the Study of the States, and from other higher education and public administration literature. Data reduction in the form of principle components analysis and scale building produced the five variables shown in the diagram -- size, wealth, political culture, mobility, and public sector strength.

Campus characteristics: Based on the organizational literature (Hall 1991, Volkwein 1986), and our own confirmatory factor analysis, the 42 campus characteristics separate into four broad categories: organizational size, financial support, mission/complexity/diversity, and quality/selectivity. The measures reflecting organizational size, wealth, and quality formed tight scales, but the complexity measures are not highly enough correlated to form a common factor. The measures of size, wealth,

and complexity we extracted from IPEDS and other data supplied by the National Center for Education Statistics. Variables reflecting faculty and student quality have been constructed from the national survey of doctoral program quality by the National Research Council, from the data assembled by Graham and Diamond (1996), and from the student and campus data reported in *Barron's* and *U.S. News*. In addition, we obtained AAUP salary data and within-campus Directory information about administrative officers and colleges and schools. From the campus administrative flexibility survey we obtained information about levels of employee unionization, flagship status, and constitutional autonomy.

State regulation/autonomy: Rules, legislation, and procedures, prescribed by the states to control academic, financial and personnel transactions of universities, are measured by campus responses to survey items and scales originally developed by Volkwein (1986, 1987, 1989), but updated and enhanced for this study (see Volkwein & Malik 1997). The survey collected responses to questions about 47 types of flexibility and control. Among the 26 survey items about financial and personnel matters, we found five dimensions of financial and personnel flexibility that are so highly correlated we combined them into a single scale of administrative flexibility. These items reflect various aspects of campus flexibility over managing budgets and revenues, expending funds, setting tuition, and appointing personnel without external approval. Regarding the 21 survey questions about academic flexibility, we found six dimensions that encompass all the academic survey items and form a common scale. These items reflect an institution's autonomy over academic programs, degree requirements, standards, and departments, as well as the institution's freedom from state imposed accountability requirements.

Administrator Characteristics: Based on the literature, we asked respondents to indicate their age and length of service, sex, highest degree, academic rank (if any), administrative rank (we imposed a hierarchy), and functional area (academic affairs, business and finance, human resources management, IR and planning, student services, and other)

Managerial Satisfaction, stress, and work climate: Using an anonymous survey distributed by the campus contacts to the 12 managers with job titles that we identified, we assess respondent satisfaction and stress in a variety of dimensions suggested in the occupational satisfaction literature. The 25 satisfaction items on the survey use a 5-point Likert type scale from very satisfied to very dissatisfied. Our principle components and data reduction techniques produced scales of intrinsic satisfaction, extrinsic satisfaction, satisfaction with work conditions, and relationships with others. Their alpha reliabilities range from .76 to .90. We use a single item to express overall satisfaction. 19 other questions use a 5-point scale to elicit responses to questions about work climate and sources of stress (1=none, 3=moderate, 5=extreme). These yielded scales reflecting perceptions about regulation, control, teamwork, workload, adequacy of funding and facilities, and stress from health, financial, and interpersonal situations.

Analytical Procedures

We concluded data collection during 1995, and in early 1996 completed a series of data reduction steps and began the analysis. The data assembled from these various sources were merged into a database and manipulated using SPSS. We conducted principle components analyses to confirm the dimensions of state attributes, university organizational characteristics, regulation/flexibility, perceived work climate, and administrative satisfaction. We used a series of OLS Regression equations to test the hypothesis that regulatory climate differences among states influence the satisfaction levels of campus managers.

RESULTS

The attached **Flexibility Grid** shows our classification of the 50 states on the relative amounts of administrative and academic flexibility that they give their universities. For each of the two flexibility dimensions, we took the separate factor scores from the principle components analysis and added them to produce a single overall scale for academic flexibility and one for administrative. Each state scoring one standard deviation or more above the mean is classified "high flexibility;" each scoring one standard deviation or more below the mean is "low." The rest are "medium." The universities with the greatest flexibility and the least state oversight on both dimensions are in the high/high box. States like Ohio, New Mexico, and Michigan enjoy above average autonomy on both dimensions. On the other hand, Illinois and Maryland are the only states in the low/low box, indicating that universities in Illinois and Maryland have comparatively less autonomy and more state oversight than their peers in this study. Reflecting the independence of these two flexibility dimensions, some states rate high/low while others rate low/high. For example, New York and Virginia are relatively high on academic and relatively low on administrative flexibility. On the other hand, Colorado and South Carolina experience the opposite condition: high administrative, low academic.

The question is, do these differences among states translate into variations in the levels of administrator satisfaction? To address this question, we first examined the correlations among the relevant variables in the database, and second, calculated a series of OLS Regression models. The attached **Correlation Matrix** shows the zero-order correlations among the two objective measures of campus autonomy (1 administrative, 2 academic), the perceived measure of external regulation (3), the three work environment stresses (4-6), and the five measures of satisfaction that we developed from the survey (7-11). The correlation matrix shows that each of the two objective measures of autonomy/flexibility (variables 1-2) are significantly correlated with respondent perceptions about external regulation, but the coefficients are only -.09 and -.35. The measure of administrative autonomy is additionally correlated with perceptions of a controlled work environment (-.09). However, neither of the first two flexibility

measures is significantly correlated with the measures of workload and interpersonal stress (5-6), nor the measures of satisfaction (7-11).

Interestingly, the measure of perceived external regulation (3) is significantly correlated with perceptions about a controlled work environment(4) workload stress(5), and interpersonal stress(6), but not with the satisfaction measures(7-11). However, the workload, interpersonal, and controlled work environment measures are negatively correlated with all five satisfaction measures. This suggests the possibility of indirect influences at work on satisfaction through the work environment.

Last, the correlation matrix shows that each of the five satisfaction measures (7-11) are strongly correlated with each other -- coefficients range from .34 to .69. Most strongly a correlated with overall satisfaction is the scale of work conditions.

We next developed a series of stepwise, pairwise, OLS regression models by entering the state characteristics, then the campus characteristics, then the regulation measures, then the administrator attributes, and finally the work climate variables. Until we entered the work climate variables the models explained trivial amounts of the variance in the five dependent satisfaction measures. The results of the final multivariate analyses are shown in the **Regression Table** which shows only the significant beta weights and R-square values.

When all the state, campus, and administrator variables are included in the stepwise regression procedure, the first column shows that four measures explain 28 percent of the variance in overall administrative satisfaction: This is a single item, rather than a scale, and the most important variables are the positive influence of administrative teamwork (.26), and the negative impacts of interpersonal work relations (-.31), workload stress (-.11), and perceptions of an overly controlled work environment (-.10).

Three of these four variables exert similar influences in the next column of the table -- the regression model for the scale of intrinsic satisfaction. (This eight-item scale reflects feelings of accomplishment, autonomy, creativity, initiative and challenge.) With an R-square of .31, the most significant influences are exerted by interpersonal stress (-.31), teamwork (.27), and a controlled work environment (-.18). Significantly less intrinsic satisfaction was reported by managers in human resources (-.09) and significantly more by those in states with a strong public sector commitment (.07).

The analysis of extrinsic satisfaction (a three item scale of salary & benefits, opportunities for advancement, and future income potential) explains only 14 percent of the variance. Influential variables include undergraduate quality (.12), administrative rank (-.18), teamwork (.14), inadequate funding (-.11), and interpersonal stress (-.15). Perhaps the only surprise here is that the higher the administrative rank, the less extrinsically satisfied.

Three variables explain 41 percent of the variance in the scale of work conditions. (These five items reflect satisfaction with hours, work pressure, job security, and organizational politics). Large negative influences are exerted by workload stress (-.42) and interpersonal stress (-.29). Again, teamwork has a positive influence (.19).

The regression model for satisfaction with work relationships (5 item scale reflecting relationships with colleagues, faculty, and students) only explains 20 percent of the variance. Once again, interpersonal conflict exerts a negative influence (-.28) and teamwork exerts a positive influence (.18). Undergraduate quality (.07) and having academic rank (.16) constitute other positive influences, while the perceived regulatory climate is a negative influence (-.08).

Looking across all five models, it is clear that the largest, most consistent, and opposite influences on administrative satisfaction are interpersonal stress and teamwork. Not only do they explain most of the variance in expected aspects of satisfaction (intrinsic and work relationships), but also in the less expected realms of extrinsic rewards and work conditions. Their influence is so pervasive their influence on overall administrative satisfaction is two or three times greater than perceptions about workload stress and about an overly controlled work environment.

Discussion and Conclusions

This topic is significant for a number of reasons. There has been much public discussion about the virtues of deregulation and decentralized, customer-based management. This study documents the 1995 status of each state's regulatory practices toward public universities and examines the evidence for a link to the satisfaction of campus managers. Although finding little relationship between the regulatory climate for public universities and a variety of other campus measures, Volkwein (1986,1987,1989) raised the possibility of a connection to managerial satisfaction. The empirical literature on state regulation and its impact on campuses is sparse. No studies in higher education have attempted to measure the impact of state regulation on administrators job satisfaction, despite the linkage in the organizational literature among managerial satisfaction and performance and turnover.

Drawing from contemporary organizational theory and building upon the literature on satisfaction, this study examines the nature of state control and university autonomy. Using a combination of campus survey data, follow up telephone interviews, and information from national sources, we constructed a database containing an array of measures reflecting campus characteristics, state attributes, the regulatory climate for public universities, and the survey results from a selected set of campus managers who responded anonymously to questions about their personal characteristics, work environments, and levels of satisfaction.

First, we confirmed the existence of two strong and relatively independent dimensions of campus autonomy: academic and administrative. The academic dimension is composed of factors reflecting campus flexibility regarding programmatic actions, setting standards and policy, degree requirements, restructuring departments, and responding to accountability requirements. The administrative dimension reflects campus flexibility regarding managing revenues, setting tuition and fees, classifying and appointing personnel, budgeting and expending funds. Such a two-dimensional framework is consistent with Berdahl's procedural and substantive autonomy and with Volkwein's studies in the 1980s that identified academic and administrative autonomy factors similar to these.

Second, we assembled an array of data that reflects the economic, demographic, social, and political characteristics of each state and found little evidence of a connection between these characteristics and either the regulatory climate for state universities or the satisfaction levels of their managers. There was a slight tendency for large states to be more controlling but this accounts for only 12 percent of the variance in administrative flexibility and none in academic flexibility. (Volkwein & Malik 1997)

Third, we also found little evidence of a connection between state control and campus characteristics. The amount of regulation is unrelated to the age, size, stature, mission, complexity, and cost of public universities. Out of 12 variables in two regressions, only one was significant (the percent of minorities) and it explains a mere seven percent of the variance in administrative flexibility and none in academic flexibility. (Volkwein & Malik, 1997)

Fourth, we examined the evidence for a relationship between the university's regulatory climate on the one hand and several dimensions of satisfaction on the other. We find that most state and campus characteristics, including the regulatory climate, have little direct relationship to administrator satisfaction. One exception is that intrinsic satisfaction is higher in states that give a priority to public sector programs and universities. Another exception is that undergraduate quality (freshman selectivity) measures are significantly associated with extrinsic satisfaction and satisfaction with work relationships. We do find that the actual regulatory climate (as measured by our data collected from institutions and states) has statistically significant but low correlations with perceptions about overly regulated and controlled work environments. These perceptions in turn are correlated with perceived work stress and satisfaction. However, most of the correlations are relatively low, ranging from .09 to .24.

While many in higher education believe that there is a connection between campus autonomy and administrative satisfaction, we find only the thinnest of evidence to support such a claim. In order to explain the low relationship between campus autonomy and job satisfaction, we need to consider the complexity of the satisfaction phenomenon. Job satisfaction is an overall measure of one's feelings toward their work (Kalleberg, 1977). Thus, it is possible for a worker to be dissatisfied with one aspect of their job, such as the salary, but on the other hand, be

very satisfied with alternate aspects, such as interpersonal relationships or elements they find intrinsically satisfying. Workers may weigh factors against one another and reach a combined satisfaction score in which positive feelings balance out negative feelings. Thus, although we did not necessarily expect to find evidence of a direct relationship between the regulatory climate and workers' **overall** job satisfaction, we did expect to find evidence of campus autonomy affecting some of the sub-components of job satisfaction.

Our analysis suggests that external regulation has no direct influence on any of the five satisfaction measures. Rather, the regulatory climate may have indirect but small influences on the work environment and on interpersonal stress. However, workplace relationships and an atmosphere of teamwork have highly positive impacts on most measures of satisfaction. This finding is consistent with Hagedorn's (1996) recent research showing that interpersonal relationships positively influence job satisfaction and also lessen job related stress.

The important and statistically robust finding in our study is the solid and consistent connection between every measure of administrative satisfaction and the human relations aspects of university administration. Interpersonal work stress exerts a consistent negative influence on satisfaction and an atmosphere of teamwork exerts a consistently positive influence. These results strongly support those theories and administrative practices which accent the importance of interpersonal relationships in creating positive work environments and organizational climates that are satisfying to managers.

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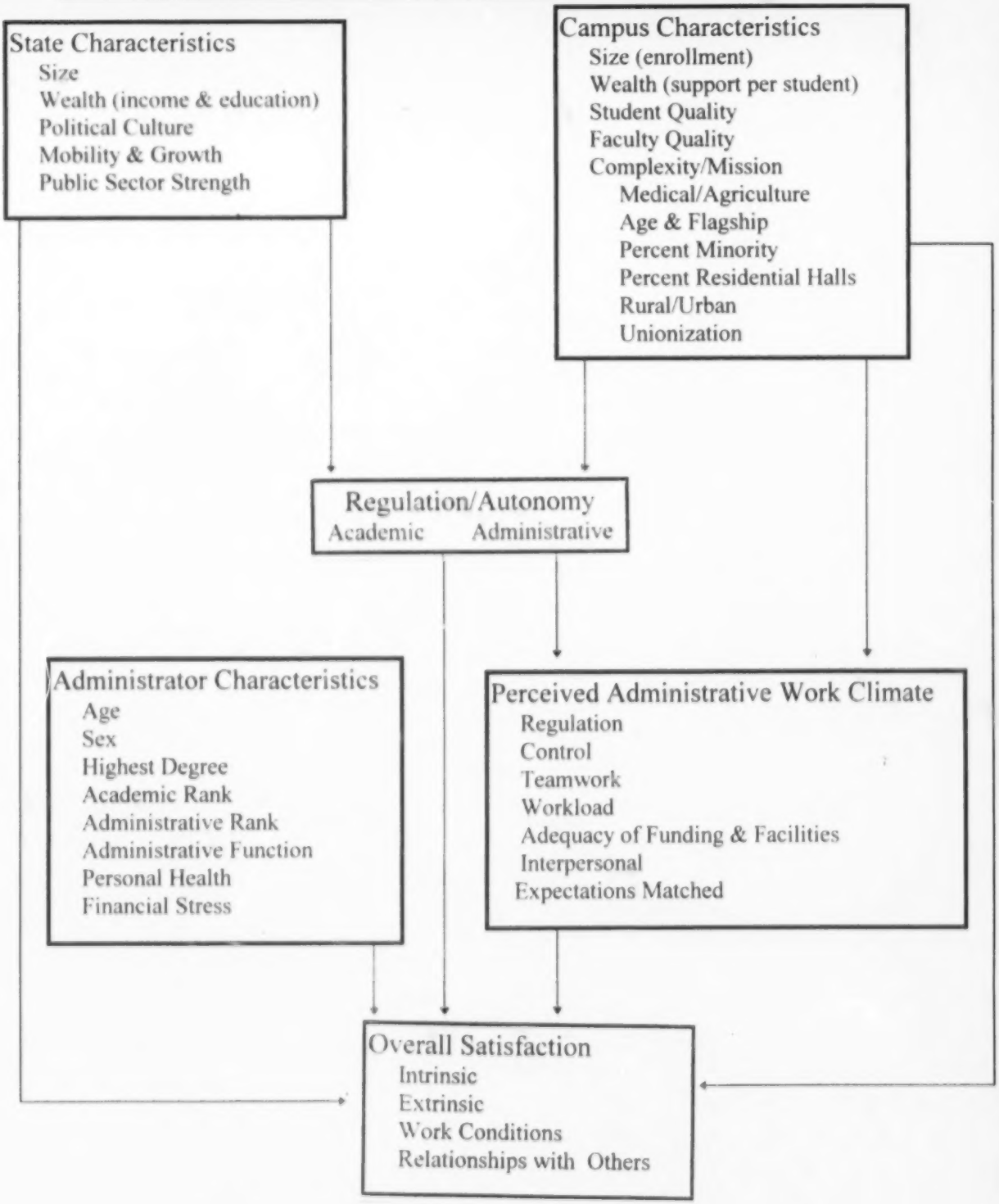
Diagram of Variables in this Study



List of Satisfaction Survey Recipients

1) Chief Academic Officer (Provost, Vice President, Vice Chancellor)

2) Chief Business & Finance Officer

3) Dean of largest college/school (non-medical)

4) Managers regardless of title that have responsibility for the following administrative offices:

a) Registrar

b) Institutional Research/planning

c) Personnel & Human Resources

d) Budget

e) Purchasing

f) Controller/Accounting

g) Payroll

h) Physical Plant/Facilities

i) Financial Aid

Administrative Respondents by Rank and Functional Area

Administrative Rank or Equivalent

Division	Vice Pres./ Provost	Dean/ Assoc. Vice Pres.	Assistant Vice Pres.	Director	"Assistant to"	Total
Academic Affairs	83	91	6	2	2	184
Business/Finance/Admin	59	21	25	44	11	160
Student Services	3	8	7	138	7	163
Planning & IR	4	1	3	53	5	66
Personnel/Human Res Mgmt	12	34	29	229	34	338
Other	2	10	16	53	3	84
Total	**163**	**165**	**86**	**519**	**62**	**995**

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Flexibility Grid

Administrative Flexibility

Academic Flexibility	Low	Medium	High
High	FL, NY RI, MA VA	NJ, OR AK WV	WY, MI, NM, AL DE, OH, VT, PA, ND, IA
Medium	KS, TX NC, CA WI	ME, LA WA, MT UT, NB	KY, AR, IN, CT NH
Low	MD, IL	OK, NV AZ, MO MN, TN, MS, GA, SD, HI ID	CO, SC

Correlation Matrix
Regulatory Climate, Work Climate and Satisfaction Variables

State Regulatory Climate	1	2	3	4	5	6	7	8	9	10	11	12
Campus Autonomy/Flexibil.												
1 Administrative	1.00											
2 Academic	18***	1.00										
Perceived Work Climate												
3 External Regulation	-.35***	-.09**	1.00									
4 Controlled Work Envir.	-.09**	.06	.24***	1.00								
5 Workload/Time Stress	-.00	-.06	.09**	.12***	1.00							
6 Interpersonal Stress	.06	.03	.02	.17***	.27***	1.00						
7 Expectations	.06	-.02	-.02	-.15***	-.11***	-.25***	1.00					
Satisfaction												
8 Overall	.01	-.05	-.05	-.19***	-.22***	-.44***	.48***	1.00				
9 Intrinsic	.01	-.06	-.05	-.27***	-.13***	-.43***	.47***	.69***	1.00			
10 Extrinsic	-.15	.05	-.05	-.10**	-.13***	-.24***	.26***	.42***	.43***	1.00		
11 Work Conditions	-.02	.01	-.06	-.15***	-.51***	-.46***	.32***	.55***	.49***	.37***	1.00	
12 Relationships	-.02	.01	-.08*	-.07*	-.13***	-.36***	.19***	.41***	.41***	.34***	.40***	1.00

Significance Levels
* = < .05
** = < .01
*** = < .001

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Regression Table

Regression Beta Weights for Administrative Satisfaction Measures With Characteristics of States, Campuses, and Administrators

Independent Variables	Dependent Variables (N=996)				
	Overall Satisfaction (1 Q)	Intrinsic Satisfaction (6 Qs, α=.90)	Extrinsic Satisfaction (3 Qs, α=.77)	Work Conditions (5 Qs, α=.76)	Relationships with Others (5 Qs, α=.82)
State Characteristics					
State size					
State wealth					
Public sector strength		.07*			
State mobility and growth					
State political culture					
Campus Characteristics					
Campus size					
Campus wealth					
Faculty quality					
Undergrad Quality			.12***		.07*
Has Medical/Hospital					
Has Agricultural college					
Flagship					
Constitutional recognition					
Campus age					
Pct. Students in dorms					
Campus rural environment					
Employee unionization					
Pct. Minority students					
Autonomy/Flexibility					
Administrative					
Academic					
Administrator Characteristics					
Age					
Female					
Highest degree					
Academic Rank					.16***
Administrative rank			-.18***		
Division					
Academic Affairs					
Business & Finance					
Human Resource Management		-.09**			
IR & Planning					
Student Services					
Perceived Work Climate					
Perceived Regulatory climate					-.08*
Controlled Work Environment	-.10**	-.18***			
Perceived Adm. teamwrk/commitmt	.26***	.27***	.14***	.19***	.18***
Sources of Stress on individ. adm.					
Pressure of workload/time	-.11**			-.42***	
Personal Health/financial					
Campus funding/facilities			-.11**		
Interpersonal Relations	-.31***	-.31***	-.15***	-.29***	-.28***
Total R^2 =	.28***	.31***	.14***	.41***	.20***

Significance levels * = < .05
** = < .01
*** = < .001

Non Significant Beta Weights not Shown

A STUDY OF INSTITUTIONAL AUTONOMY IN THE COMMUNITY COLLEGE AND ITS RELATIONSHIP TO ADMINISTRATIVE JUDGEMENTS OF INSTITUTIONAL EFFECTIVENESS

Anita C. Voogt
Associate Dean of Academic Affairs
Dutchess Community College

Purpose

The dramatic growth and increased costs of higher education since World War II have brought growing concern about the fiscal accountability of public colleges and universities. Government provides substantial financial support to public higher education; along with its increased dollars has come increased government regulation which, many contend, has significantly eroded the authority of higher education institutions (Carnegie Foundation, 1982; Millett, 1984; Burke, 1994). While recent government regulatory trends are making higher education increasing accountable for student academic achievement (Barr, 1995), educators claim that excessive government controls on fiscal and personnel matters adversely affect the ability of higher education to fulfill its academic mission effectively (Mingle, 1983; Millett, 1984). Limited empirical evidence exists, however, to support these claims.

After years of reported local government interference in the operation of the community colleges of the State University of New York (SUNY), in 1988, New York State enacted the "Plan C" legislation intended to increase the autonomy of the SUNY community colleges in the management of their fiscal affairs, and to create a uniform statewide fiscal operating system. This study examined the nature and extent to which the autonomy of the SUNY community colleges changed five years after the legislation, and explored various factors and political action strategies thought to influence institutional autonomy. Additionally, the study explored the perceived relationship between autonomy and selected measures of institutional effectiveness.

Conceptual Framework

Institutional Autonomy: Institutional autonomy refers to the degree to which public higher education can govern itself without external controls (Dressel, 1980). In practice, government can exert controls on public higher education through procedural restrictions on items such as salary and personnel classification standards, and transfers between budget categories (Fonte, 1993). Proponents of government regulation claim that such procedural controls do not adversely affect the substantive academic core of the institution (Berdahl, 1971), and that government, as a major funding source and the authorized taxing agency, has the responsibility to require of higher education accountability in its fiscal matters (Haberaecker, 1987).

Opponents of government regulation, on the other hand, argue that the cumulative effect of such controls exceeds financial and personnel matters, and infringes on the authority of educators in academic matters (Darnowski, 1989). Such controls, they claim, reduce campus efficiency, adaptability, and possibly academic effectiveness (Dressel, 1980). Furthermore, the university is thought to be a unique social institution whose independence is crucial if society is to be well served (Carnegie Foundation, 1982).

Organizationally, if public colleges and universities are viewed as "open systems" influenced by the elements that surround them, their regulatory relationships with government form an important feature of the external environment. As such, the Resource Dependence Model (Aldrich & Pfeffer, 1976), provides a useful framework through which these regulatory relationships and their subsequent effect on the autonomy of the institution can be examined.

Factors and Strategies: Other than the budgetary relationships with the external environment, this study examined the correlation between autonomy and the following three clusters of variables that, based on the work of Volkwein, (1987), Fonte, (1988), and Caswell, (1988), are also thought to be correlated to autonomy.

Cluster I: Institutional Characteristics - The Age, Size, Mission, Historical Development, and Level of Resource Dependence of the college.

Cluster II: Contextual Variables - Location/Socio-Economic Factors, County Government, Perceived Quality and Importance, and State Statutes

Cluster III: Political Action Strategies - Grass Roots Advocacy, Media campaigns, Liaison with State Agencies, Political Action Committees

Institutional Autonomy and Institutional Effectiveness: Conceptually, issues of autonomy is related to institutional effectiveness through the governance function of the institution. Governance is the means by which academic leaders make critical administrative decisions that influence organizational culture and climate. Culture and climate, in turn, potentially affect academic quality and student academic achievement (Peterson, 1986).

Institutional Effectiveness is a complex, multi-dimensional construct that is difficult to define and, hence, difficult to measure. Limited empirical evidence exists to support claims of the asserted positive relationship between autonomy and effectiveness (Volkwein (1986). Using the four effectiveness dimensions of The Integrated Model of Institutional Effectiveness (Parsons, 1967), as described below, this study explored the correlation between autonomy and a range of effectiveness indicators not yet included in the empirical evidence.

Dimension I: Adaptation - the institution's efforts to accommodate to its environment; measured in this study by the nature and extent of curricular innovation.

Dimension II: Goal Attainment - the setting and achieving of institutional goals; measured in this study by Academic Achievement (graduation and attrition rates); and Resource Acquisition (funding).

Dimension III: Integration - the institution's ability to maintain solidarity; measured in this study by the perceived administrative supportiveness of the colleges' teaching and learning function.

Dimension IV: Latency - the institution's ability to create and to preserve its unique values and identity; measured in this study by the motivational climate and the

perceived satisfaction with the institution of the faculty, administrators, and students.

Methods and Data Sources

Measures of Autonomy: This study defines autonomy as the degree to which the SUNY community college is free from fiscal and personnel controls exerted on it by the local government (referred to as the local sponsor). The sources of autonomy data were two unpublished Plan C Surveys of the thirty SUNY community colleges, one conducted in 1988 just prior to the legislation, and then repeated in 1994 (Hankin, 1988, 1994). The surveys were three part, forced-choice, "yes-no" questionnaires on fiscal, personnel, and operational autonomy matters. Autonomy levels were measured according to regulatory scales developed by Garms (1977), Curry and Fischer (1986), Volkwein (1986), and Fonte (1988) in six areas: budgeting flexibility; budget form; expenditure oversight; tuition and revenue control; local authority; and personnel administration. The survey data was analyzed to determine the nature and extent of the change in fiscal, personnel and operational autonomy for three groups:

Group I: The Thirty SUNY Community Colleges - This analysis shows the change in autonomy, system-wide, and identifies those colleges which, in 1994, had the higher and lower levels of autonomy.

Group II: The (previously) Plan A and Plan C Colleges - In 1988, twenty-five community colleges operated under Plan C; five colleges operated under a more restrictive fiscal system, referred to as Plan A, and converted to Plan C as a result of the legislation. This analysis compares the change in autonomy between the more restricted Plan A colleges with that of the more autonomous Plan C colleges.

Group III: The Higher and Lower Autonomy Colleges - This analysis compares the differences in autonomy between the five higher and five lower autonomy colleges. These colleges comprised the sample that was studied in regard to the factors and strategies thought to be correlated to autonomy, and the perceived relationship between autonomy and selected measures of institutional effectiveness.

Factors, Strategies, and Measures of Institutional Effectiveness: Qualitative data, and where possible, quantitative data was also gathered on each of the three cluster variables and four effectiveness dimensions previously mentioned. Qualitative data was gathered from one-on-one structured inter-views with the college president, chairperson of the board of trustees, and the academic and administrative deans at each of the ten colleges in the sample. Quantitative data was gathered from selected SUNY and college reports.

Comparing the higher and lower autonomy colleges, the qualitative data was analyzed to determine the degree to which autonomy is perceived to be correlated to each of the variables. The quantitative data was analyzed using Pearson's Product-Moment Correlation with a bivariate analysis to determine the degree of significance to more objectively assess the correlation.

Conclusions and Results

The Change in Autonomy: The fiscal autonomy of the thirty SUNY community colleges increased by twelve percentage points (from 80 percent in 1988,

to 92 percent in 1994), most significantly in the colleges' authority to name their own treasurer, to have their own bank accounts without sponsor intrusion, to retain interest on all college funds, to make their own investment decisions, and to transfer funds between budget categories. While the Plan A colleges gained the most autonomy, they remain, as of 1994, less autonomous than the Plan C colleges with critical issues yet to be resolved regarding authority to do their own purchasing, to maintain their own accounting and payroll systems, and to make unrestricted transfers between budget categories.

Personnel autonomy also increased, but to a lesser extent than fiscal autonomy. With faculty and professional staff, significant increases occurred in the colleges' authority to promote faculty without sponsor approval, to offer fringe benefits different from the sponsor, and to add faculty and administrative lines after budget approval. Significant decreases, however, also occurred in the colleges' authority to bargain directly with the faculty.

With civil service staff, other than the authority to add non-professional lines after budget approval, less than half of the colleges can act without sponsor approval to offer their own fringe benefits, to upgrade secretarial positions, to process grievances, to increase salaries, and to bargain directly with the civil service. Again, while the most significant increases occurred among the Plan A colleges, surprisingly, a minor decrease in personnel autonomy occurred among the Plan C colleges.

In operational matters, the colleges' authority to use other than the county attorney continues to be a critical autonomy issue. Additionally, the intent of the legislation to establish a uniform state-wide fiscal operating system was not achieved, and is an unrealistic expectation under the current organizational structure of the SUNY community colleges. While the legislation ensured that all the colleges would receive their funds in the same way, through a lump sum transfer from the sponsor, it did not ensure uniformity in the parameters through which those funds could be expended.

Factors and Strategies: Of the three clusters of variables examined, a significant correlation was found between autonomy and five institutional and contextual variables: the size; geographic location; level of resource dependence on the local sponsor; historical development of the college; and the county charter. Collectively, the higher autonomy colleges appear to be the smaller, rural colleges that are minimally supported by local sponsor funds. These colleges also tend to have had a history of autonomy from the local sponsor, and tend to have been unrestricted by the county charter. This profile is consistent with the Resource Dependence model indicating that lower dependence on the environment, in this case lower financial dependence on the sponsor, translates into greater autonomy.

In addition to the autonomy-related factors suggested in the literature, the qualitative data of this study suggest that autonomy is also significantly correlated to the local political and economic influences, and to the level of interpersonal communication and trust between the college and the sponsor. It is thought that as long as the sponsor has budgetary control over the college, the autonomy of the college and the nature of sponsor influence will vary given the economic times and the political philosophy of the individuals who make up the legislative body. While the community colleges are often viewed as "the best game in town", they have not successfully translated their benefits to the county into political capital.

Institutional Effectiveness

Adaptation: According to these data, autonomy is not significantly correlated to curriculum innovation and vitality, nor does it significantly hamper the college in its mission to be adaptive and responsive to local community educational needs.

Goal Attainment: Graduation Rates - Of the two cohorts examined, the analysis of the graduation rates showed a significant, positive correlation with autonomy for one cohort, and a strong but not statistically significant correlation for the other cohort. While these findings are inconclusive, they identify this as an important area for continued research.

Resource acquisition - A strong negative correlation was found between autonomy and funding from the sponsor. The higher autonomy colleges receive a significantly lower proportion of their funding from the sponsor, relying instead on alternative revenue from charge backs for their out-of-county students. While the lower autonomy colleges receive a higher proportion of funding from the sponsor, they are subject to a greater degree of regulation, and they also experienced a significantly greater decrease in sponsor support when funding patterns were analyzed over time, between 1988 and 1994.

Integration: Autonomy is perceived to affect the salaries and qualification of the faculty and administrators with disruptive challenges to the colleges' authority in key personnel decisions. Autonomy is not perceived to be a significant influence on the academic climate of the college, nor on the way funds are allocated to the colleges' various academic units.

Latency: A significant positive correlation is perceived to exist between autonomy and the motivational climate of the administrative domain of the institution, with concerns among the lower autonomy colleges about the level of bureaucracy, demands on administrators' time, and distractions from the academic work of the college. The correlation with the motivational climate of the instructional domain, and with teaching faculty specifically, is perceived to be minimal because of their limited interaction with the sponsor. Some concern was expressed, however, that the faculty may misunderstand the autonomy issues and view the college leadership as powerless. Additionally, the students are perceived to be unaffected by autonomy issues, primarily because the potential adverse effects of autonomy are mitigated by the professionalism and resourcefulness of the faculty and staff. The recurring theme throughout the data is the difficulty in measuring the relationship between autonomy and the effectiveness of the institution because, despite controls, the college personnel find ways to do what is necessary to provide a high quality education.

Significance for Practice and Theory within Higher Education

This study is particularly significant in light of the shared interest and responsibility of higher education and government to provide quality educational services under the stringent fiscal conditions that currently prevail. While building on the current limited empirical evidence about the autonomy of the community college sector of public higher education, the findings of this study support several

recommendations for practice and theory.

For the practitioner, for example, future autonomy efforts would be better directed to focus on specific areas where additional flexibility is needed, coupled with the specific improvements that should result - improvements that legislators and the public can measure and understand. Future research would be well served to explore how increased autonomy has improved the effectiveness and productivity of the college, administratively and academically.

For community colleges similar in structure to those of SUNY, the lack of uniformity under the Plan C legislation points to questions about the role of SUNY as the state coordinating agency. What is the role of the state coordinating agency - mediator, arbitrator, negotiator, advocate - in issues that are often as equally related to education as they are to local economic and political conditions? More basic, perhaps, is to question the practicality of the organizational structure of the SUNY community colleges that requires them to report to two bosses, one of which (the local sponsor) holds the power of a negotiated budget and wields control far beyond the extent of its financial support. Further study of the role of the state coordinating agency, and the organizational and funding structure of the community colleges is warranted if significant change is to occur.

The political dimensions of the public college-sponsor relationship require that college leaders are equally adept working in the political and academic arenas. Further development of the political leadership of the SUNY community colleges, and of public higher education institutions in general, needs to continue along with further research on the political nature of the college-sponsor relationship.

Understandably, complete autonomy, just as complete accountability, is unattainable and inappropriate in light of legitimate public interests about the funding and the role of public higher education. Continued efforts toward increased academic accountability are needed to strengthen the position of higher education in the continuing policy debates concerning the autonomy of public higher education institutions.

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DEVELOPING A POSTSECONDARY EDUCATION TAXONOMY FOR INTER-INSTITUTIONAL GRADUATION RATE COMPARISONS

Timothy A. Walsh
Temple University

Introduction

Much of the research on postsecondary completions over the past fifty years has concentrated on student characteristics that influence retention, attrition and graduation (Pascarella and Terenzini, 1991, Tinto,1987). The studies of institutional factors have been limited to only a few institutions, with large differences in graduation rates - primarily due to differences in definitions and methodology (Robb and others, 1988). In the 1980s public interest in college graduation rates grew, in part because of the concern over exploitation of football and basketball student athletes, but also by demands for higher education accountability. Within higher education, graduation rates were adopted as measures for assessment and Total Quality Management benchmarking. The *Student Right-to-Know and Campus Security Act* of 1990 provided a standard methodology for calculating and reporting graduation rates for almost all higher education institutions in the United States. With the growing interest in graduation rates, colleges are asking who are their peers for graduation rate comparisons.

This study took the student variables associated with college graduation and matched them with publicly available institutional data to first develop a taxonomy for graduation rate comparisons. This taxonomy was then used to group colleges according to these factors.

Methodology

The literature identifies several student and institutional variables that are associated with college graduation. Successful completion of college has been linked to the demographic variables of gender, ethnicity, age and socio-economic status. Academic ability is often associated with high school class rank, standardized test score, and remediation. Several institutional characteristics are also associated with graduation. Institutional setting (city, suburb, small town or rural), number of other colleges in the area, region of the country, sector, mission, size, housing, student-faculty ratio, proportion of the E&G budget allocated to student services, selectivity, and full-time attendance.

These variables associated with graduation were matched against publicly available data. The analysis used data for the 1991-92 academic year. The six-year graduation rate used the 1985 cohort for each college. The Integrated Postsecondary Education Data System (IPEDS) provided considerable data. The Fall Enrollment Report provided headcount by academic level, full/part-time attendance, gender and ethnicity data. Total Educational & General (E&G) funds, student services expenditures and federal research revenue were available from the IPEDS Financial Report. The IPEDS Institutional Characteristics report provided data on sector, region and the number of other institutions in the area (using the first three digits of the zip code). The number

of full-time faculty came from the IPEDS Salaries, Tenure, and Fringe Benefits of Full-Time Instructional Faculty report.

Average age of undergraduates, percent of undergraduates receiving financial aid (a proxy for socio-economic status), percent of freshman applicants admitted, average freshman combined SAT score, percent of freshmen from the top 10%/25% of their high school class, Carnegie classification and percentage of students taking only remedial courses were obtained from Minter Associates. *Peterson's Guide* was used to obtain the number of students living in residence halls. *Barron's Guide* provided the institutional setting (urban, suburban, small town or rural). ACT scores were converted to SAT scores based upon a College Board conversion table.

The Carnegie classifications could not be used in subsequent analysis. However, the component parts (liberal arts/ comprehensive curriculum focus, doctoral degrees awarded and federal research dollars) could be substituted in the subsequent analysis.

A total of 998 bachelors degree institutions had all the necessary data fields and could be used for subsequent analysis.

ANALYSIS

This study used factor analysis to identify the underlying structure of the data. These factors were then used in cluster analysis to group institutions with similar characteristics associated with graduation. It was hoped that cluster analysis would be a mathematically elegant solution to grouping colleges, rather than relying upon investigator judgement.

While not required for factor analysis, zero order correlations were calculated. The primary reason for performing this analysis was to refine two variables. The percent of freshmen in the top ten and twenty-five percent of their high school class obviously measure the same thing. The student-faculty ratio could be calculated several ways. Ideally the FTE undergraduate students to FTE faculty who teach undergraduates would be used. However that data were not available. Instead, three variations of student-faculty ratio were calculated - total students to total full-time faculty, total undergraduates to total full-time faculty, and FTE undergraduates to full-time faculty.

The percentage of freshmen in the top 25% of their high school class was dropped from further analysis since the top ten percent proportion had a higher correlation with graduation rate (.6355 vs. .6094). Similarly, FTE student and total student-faculty ratios were dropped because the undergraduate student-faculty ratio had a higher correlation with graduation rate (-.3282 compared to -.2983 and -.2690 respectively). The other variables that failed to be significantly correlated with graduation rate were also dropped for simplicity of further analysis. Total headcount and total undergraduates failed to be significantly correlated with six year graduation rate. Proportion of the undergraduates who are male was also dropped. Setting (urban/non-urban) was not significant, nor was the proportion of the E&G budget allocated for student services.

FACTOR ANALYSIS

The remaining variables were used in an SPSS factor analysis (Table 1). Five factors emerged with an eigenvalue greater than 1.0. These five factors explain 67.7% of the variance in graduation rate.

The presence of non-traditional students explained 24.9% of the variance. The variables that contribute most to this factor are the average age of undergraduates, percent of undergraduates attending part-time, percent of undergraduates living in housing, the number of other colleges in the area, and the undergraduate student-faculty ratio.

Student academic ability explained an additional 17.4% of the graduation rate variance. The variables that contribute most to this factor are the average SAT score, percent of applicants admitted, percent of freshmen in the top ten percent of their high school class, percent of undergraduates receiving financial aid, comprehensive/ liberal arts curriculum focus and the number of other colleges in the area.

The third factor was institutional mission, which explained an additional 9.1%. The variables that contributed most to this factor were federal research dollars, doctoral degrees awarded and liberal arts/ comprehensive curriculum focus.

The institutional sector is the fourth factor (8.7% of the graduation rate variance). It is primarily defined by the percent of undergraduates receiving financial aid, public/ private sector, and the number of colleges in the area.

The fifth factor is the presence of disadvantaged students (explaining 7.6% of the graduation rate variance). Average freshman SAT score, percent of freshman applicants admitted, percent minority students, and percent of undergraduate students taking only remedial courses are the variables that primarily define this factor.

CLUSTER ANALYSIS

Factor scores were calculated for each of the 998 bachelors degree granting colleges. The factor scores were standardized to compensate for differences in scaling. There are a variety of ways to calculate clusters. Distances between clusters can be calculated by measuring the squared Euclidean distance between the nearest two observations, or the furthest, or the average distance. This analysis used the SPSS Cluster function using the nearest neighbor to define the joining of groups. However, the 998 by 998 correlation matrix necessary for cluster analysis could not be handled by the mainframe computer.

While the SPSS Cluster function would not work, another SPSS program called Quick Cluster would. With Quick Cluster the researcher specifies the number of clusters desired. Solutions for ten, twenty, thirty, forty, fifty and one hundred clusters were calculated. After investigating the groupings, it appeared that the optimal solution was somewhere near thirty clusters. Twenty-five to thirty-five cluster solutions were then calculated. The thirty cluster solution appears to be the best grouping of colleges (Table 2).

In the process of analyzing the cluster groupings it became evident that a purely mathematical solution of which colleges should be grouped as peers is not possible. Peer cluster determination is still as much an art as a science. The membership in each cluster may still be more dependent upon the purpose for the analysis.

CONCLUSION

The primary benefit of this analysis was the identification of the factors associated with graduation. The presence of non-traditional students, academic ability, mission, sector and proportion of disadvantaged students explain about 68% of the variance in graduation rates. It is possible that with the growing availability of data that additional variables that contribute to graduation will be obtainable.

This study originated with the hope that there could be a mathematically elegant solution to the age old question of peer institution identification. The current cluster analysis techniques still require considerable judgement on the part of the researcher.

The clusters that were formed still had considerable variance in graduation rate (up to 45%), even though the institutions and students were similar. There are other research initiatives that are looking at outliers (Krock et al.,1995) or looking at the reasons for differences between expected and actual graduation rates (Astin,1993). These initiatives may identify the reasons why supposedly similar institutions have disparate graduation rates

Table 1: FACTOR COEFFICIENTS FROM FACTOR ANALYSIS

VARIABLE	Non-Traditional Students: FACTOR 1	Student Academic Ability: FACTOR 2	Mission: FACTOR 3	Disadvantaged Sector: FACTOR 4	Disadvantaged Students: FACTOR 5
Average Age of Undergraduates	**.29767**	.06230	-.01213	.05129	-.00715
Undergrad Percent Part-Time	**.38898**	.08501	-.00127	.17623	-.12462
Percent of UG in Campus Housing	**-.24750**	-.02896	-.08952	.11171	-.04022
UG Student/Full-Time Fac Ratio	**.26378**	.03774	-.06518	.07268	-.09992
Average Freshman SAT Score	-.00543	**.30581**	-.02411	.03589	**-.20695**
% Freshmen Applicants Admitted	-.03022	**-.34579**	.07589	-.00114	**-.25870**
Percent UG Receiving Fin Aid	-.14366	**-.35384**	.11990	**.35515**	-.09241
Freshmen Percent in Top 10% of High School Class	-.04357	**.29242**	.02411	.03379	-.01757
Federal Research Dollars	-.01860	-.01397	**.42544**	.04892	-.04833
Number of Doctoral Deg Awarded	-.02564	-.04404	**.43764**	.01699	-.08757
Comprehensive (1)/Lib Arts(2)Focus	.00831	**.28367**	**-.36732**	.03379	-.06375
Sector (Public=1; Private=2)	.03255	-.02007	-.02745	**.51413**	-.09241
Number of Colleges in Area	**.21518**	**.18640**	.06660	**.48737**	.14698
Percent UG Minority Students	-.04843	-.00946	.06707	.12366	**.57787**
Percent of UG Students Taking Only Remedial Coursework	-.06623	.08296	-.13736	-.11166	**.46663**
Percent of Variance Explained	24.9%	17.4%	9.1%	8.7%	7.6%

Variables having the most impact on the factor are bold faced.

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Table 2: AVERAGE FACTOR SCORES FOR THE THIRTY CLUSTER SOLUTION

	Number of Cases	Non-Traditional Students: FACTOR 1	Student Academic Ability: FACTOR 2	Mission: FACTOR 3	Sector: FACTOR 4	Disadvantaged Students: FACTOR 5
Cluster 1	31	1.10762	0.41186	0.15262	2.02104	0.47755
Cluster 2	4	0.00977	2.92457	0.41190	2.23967	0.90868
Cluster 3	136	-0.75031	-0.88422	-0.01137	0.39693	-0.25751
Cluster 4	17	-0.45628	0.70025	1.72462	0.73259	-0.16547
Cluster 5	8	-0.78285	3.22693	-1.05344	0.91304	0.53203
Cluster 6	4	-0.23314	2.09444	3.72090	1.95731	-0.10363
Cluster 7	2	-1.61604	-0.84529	-1.10799	-0.01035	9.73234
Cluster 8	3	-1.27552	0.87339	-1.37415	-0.51113	2.60919
Cluster 9	1	-0.65823	-0.98646	0.02125	-0.65124	4.88222
Cluster 10	42	-0.08525	0.02316	1.55751	-1.27213	-0.35855
Cluster 11	2	-0.24220	3.51852	4.93834	3.57116	0.55393
Cluster 12	9	2.77962	-0.18461	-0.70776	1.58141	-1.27258
Cluster 13	58	1.29529	-0.63977	-0.03381	0.84608	-0.41286
Cluster 14	25	-0.93038	-1.13646	0.20831	0.88120	2.82017
Cluster 15	2	1.67022	-0.06900	0.34356	1.38252	3.54589
Cluster 16	4	-0.96706	1.96669	5.87984	-0.18600	0.04568
Cluster 17	47	-0.93319	1.98992	-0.96140	-0.01410	-0.16430
Cluster 18	9	-0.18754	0.21675	4.55721	-0.93957	-0.82378
Cluster 19	1	1.08060	1.89369	5.52550	2.40628	-0.73123
Cluster 20	21	1.56532	0.50909	0.10763	-0.11709	1.11398
Cluster 21	75	1.27626	0.36817	-0.34826	-1.27931	0.00935
Cluster 22	3	-0.57063	1.18760	-0.57095	1.59720	3.53665
Cluster 23	153	-0.78400	0.39020	-0.79792	0.18900	-0.58604
Cluster 24	1	-1.01938	-0.09069	-1.76482	-1.70134	8.05987
Cluster 25	11	-1.03451	2.45080	2.14791	-0.24664	0.13391
Cluster 26	15	2.88376	0.48250	-0.24396	0.53863	-0.01986
Cluster 27	133	0.21758	-0.44677	-0.09063	0.56508	-0.21931
Cluster 28	12	-0.34825	1.61235	0.47064	-1.49501	0.73823
Cluster 29	147	0.00340	-0.48425	0.01715	-1.20050	-0.08829
Cluster 30	22	-0.20775	-0.87793	0.09381	-0.33208	2.22151

Factor 1 - Non-traditional Students [non-traditional is positive]

Factor 2 - Student Academic Ability [high academic ability is positive]

Factor 3 - Mission: Research/ Liberal Arts Focus [research focus is positive]

Factor 4 - Public/Private Sector [private sector is positive]

Factor 5 - Disadvantaged Students [high proportion of minority students is positive]

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INCREASING THE UTILITY OF THE COLLEGE BOARD STANDARD VALIDITY STUDY AN MS-DOS QBASIC PROGRAM FOR PREDICTING AN APPLICANT'S COLLEGE PERFORMANCE*

Jishen Zhao
Statistician/Analyst of Institutional Research
The College of Saint Rose

Introduction

Multiple linear regression analysis has been widely used in higher education enrollment management. Based on an optimal linear combination of an applicant's SAT scores, high school GPA, and high school rank, this statistical technique provides college admissions officials with a prediction model that generally forecasts a prospective student's college performance with decent accuracy.

As the most popular option of the College Board Validity Study Service, the Standard Validity Study prepares freshman GPA prediction models tailored to the specific needs of individual institutions. While doing so, it also measures the accuracy of the predictors and estimates the magnitude of the prediction error (The College Board, 1988). Conceptually, a typical report from the Standard Validity Study can be viewed as a combination of two parts: model presentation and model application. Describing and evaluating the prediction model and its supporting data set, the model presentation component contains (a) frequency distributions for each variable; (b) a summary of descriptive statistics for each variable, and correlational statistics between the predictor(s) and the criterion; (c) an analysis of predictor-criterion relationships, including multiple correlations, standard errors of estimate, and regression coefficients; (d) an experience table of predicted and obtained grades, and (e) correlation matrices indicating correlations among all variables. Ameliorating the application of the prediction model in recruiting potential students, the model application component involves (a) a computational aid to approximate the predicted grades, and (b) an expectancy table to assess an applicant's probability of obtaining certain grades. Although the College Board has prepared very readable documentation helping the consumer understand the prediction model presented in its study report, the lookup tables it supplies for model application compromises the utility of the study for two reasons. First, admissions officials very often may not have the time to consult a prediction model in their daily operation. However, when they turn their attention to this enrollment management aid, they are probably looking for the most accurate information possible to facilitate their decision-making process.

* The author wishes to thank Dr. Donald Dean, Mary Grondahl, Dr. Rusan Chen, Nancy Ervin, and Felicia Lyu for their help and support in developing FRGPA.

A lookup table such as the computational aid that contains the mid-points of some twenty intervals rather than all possible points apparently will not meet their information needs. Second, just as a college student nowadays will use a calculator rather than a slide rule to solve a mathematical problem, it is probably not efficient in this computer age to use a lookup table at all when virtually every college campus has realized its office automation.

In order to increase the utility of the College Board Standard Validity Study, the model application component of the study report was computerized to help admissions officials predict an applicant's college performance. MS-DOS QBasic, a programming language that resides in certain MicroSoft operating systems, was chosen for this purpose because of its common accessibility and user-friendliness. In addition to the prediction aids, a decision-theoretic model was included in the computer program to quantify the utilities of admissions decisions.

Program Description

Freshman GPA Prediction and Extensive-Forms Analysis

FRGPA, an MS-DOS QBasic program, was developed based on the College Board Validity Study for The College of Saint Rose. In place of the computational aid in the study, this computer program directly estimates a prospective student=s freshman grades (*GPA*) based on his/her high school average (*HSAV*), SAT scores (*SAT*), and high school rank (*HSRANK*), using the following well-tested multiple linear regression equation from the study report:

$$GPA = B_0 + B_1 HSAV + B_2 SAT + B_3 HSRANK.$$

At the same time, FRGPA supplies the relevant information from the expectancy table by computing the applicant's probability of earning a certain GPA or higher. Assuming that the obtained GPAs (GPA_os) of the applicant with a predicted GPA of g distribute normally with a mean of g and a standard deviation equal to the standard error of estimate (σ_{GPA}) of the regression equation, the applicant's probability of obtaining a GPA_o or higher can be found by determining the area under the standard normal curve for the z score of $\frac{GPA_o - g}{\sigma_{GPA}}$ (The College Board, 1988).

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Starting from the calculated probability $(p|X)$ that the applicant will gain the cutoff GPA score (X), FRGPA further estimates the expected utility of a select decision ($\varepsilon(u)_s$) as well as the expected utility of a reject decision ($\varepsilon(u)_r$), using the following extensive-forms analysis model (Crocker & Algina, 1986):

$$\varepsilon(u)_s = u_{tp}(p|X) + u_{fp}(q|X), \qquad \varepsilon(u)_r = u_{fn}(p|X) + u_{tn}(q|X),$$

where

u_{tp} = utility of a true positive event, u_{fp} = utility of a false positive event,

u_{fn} = utility of a false negative event, u_{tn} = utility of a true negative event,

$p|X$ = probability of success, and $q|X$ = probability of failure (*i.e.*, $1 - p|X$)

Novick and Lindley (1978) discussed the procedures to compute utilities of various events. For FRGPA, a simplified approach was adopted by utilizing the following set of numerical values from Crocker and Algina (1986, p. 279):

$$u_{tp} = 1.00,\ u_{tn} = 1.00,\ u_{fn} = .25, \text{ and } u_{fp} = .75.$$

The FRGPA user may want to compare the two expected utility values when they are available. It is advised that the decision alternative with a greater expected utility should be a rational choice.

Operational Procedure

1. Start MS-DOS QBasic:

   - Move the mouse until the arrow points to the **Accessories** program group icon in Microsoft Windows, and double click.
   - Move the pointer to **MS-DOS QBasic** program item icon in the **Accessories** window and double click.

2. Start FRGPA:

   - Press the **Esc** key to clear the dialog box after the welcome message of MS-DOS Qbasic appears.
   - Move the pointer to **File** in the menu bar and click to open the pull-down menu. Move the pointer to the **Open** command, and click to activate its dialog box.
   - Move the pointer to **[-A-]** in the **Dirs/Drives** section of the **Open** dialog box and click to change the drive (Assuming FRGPA is kept on a floppy diskette in A drive) .

- Move the pointer to **FRGPA.BAS** in the **Files** section of the **Open** dialog box and click to select the code.
- Move the pointer to **< OK >** at the bottom of the **Open** dialog box to start the application.

3. Run FRGPA:

- Move the pointer to **Run** in the menu bar after the FRGPA code appears on the screen, and click to open the pull-down menu. Move the pointer to the **Start** command, and click to activate its dialog box.
- Enter the following applicant information as prompted when the FRGPA identification screen shows up: Name, Social Security Number (in the format of ###-##-####), High School Average, High School Perfect Average, High School Rank, High School Class Size, SAT-Verbal, and SAT-Math. Press the **Enter** key after each piece of information is typed in.

4. Exit or restart:

- Press any key to return to the FRGPA code screen after the one-page output rolls out of the printer.
- Begin another run of the program by activating the **Run** menu again, or quit the program and return to the **Accessories** window by clicking **Exit** in the **File** menu.

It should be mentioned that the above procedure can also be completed on the keyboard alone. Besides, MS-DOS QBasic is not a windows program, and FRGPA can be accessed in a DOS environment as well.

Technical Notes

Two technical issues involved in developing FRGPA need to be addressed briefly:

1. Prediction model The College Board Validity Study Service proposed five prediction models for our college based on five consecutive years= data. Since ours is a small comprehensive type II institution with only an average of 160 valid cases for an annual undergraduate enrollment analysis, the five prediction models are not totally stable in a statistical sense. In an effort to increase the sample size underlying the prediction model, a multivariate analysis of variance (MANOVA) was conducted to identify those classes of freshmen who were statistically more homogeneous in terms of their mean high school average, high school rank, and SAT scores. As a result, a total of 463 freshmen excluding outliers in three eligible classes were selected to form a larger sample, and a new prediction model was built accordingly.

2. Normal distribution table In order to computerize the expectancy table from the Standard Validity Study report, a normal distribution table must be included in the computer program that indicates the areas under the standard normal curve for z scores between .01 and 3.00. As MS-DOS QBasic carries no function that serves this purpose, a SAS/IML program was written to generate normal distribution value statements in an MS-DOS QBasic format that were subsequently copied into the program.

Program Availability

FRGPA runs on any decent IBM-compatible PCs equipped with the MS-DOS QBasic program. The interested colleague should send a 3.5-inch blank IBM-formatted diskette along with a pre-stamped, self-addressed diskette mailer to the following address:

Jishen Zhao
Satistician/Analyst of Institutional Research
The College of Saint Rose
432 Western Avenue
Albany, NY 12203.

To receive a customized program for your institution, an information sheet should also be sent that specifies (a) your institution's prediction model, (b) its standard error of estimate that usually appears in the Analysis of Predictor-criterion Relationships section of a Standard Validity Study report, (c) desired GPA points for the expectancy table, and (d) the cutoff score for the extensive-forms analysis. It is highly recommended that an FRGPA user inform the author of the status of the program usage within a month after FRGPA is received. Any comments and suggestions regarding the program will be greatly appreciated.

Limitations of FRGPA and Prediction Models in General

As a tentative attempt to computerize the model application component of the College Board Standard Validity Study report, FRGPA is still limited in the number of prediction aids it carries. An extensive-forms analysis model is included, yet the assignment of utility values remains largely arbitrary. FRGPA should be used with caution for various reasons. The most important one the user should be aware of is the inherent limitations of multiple linear regression analysis. The literature is abundant in terms of prediction errors resulting from such factors as range restrictions and heterogeneous subsamples. The FRGPA user is referred to Zubrow (1989) for a very relevant discussion.

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NEAIR 23rd Annual Conference Program	
Saturday, November 16	
1:00 - 6:00 p.m.	**Conference registration in the Nassau Foyer**
2:00 - 6:00 p.m. Michael Matier Associate Director of Institutional Planning & Research Peter Hurst, Senior Research and Planning Associate Cornell University **CANCELLED**	**Facilitating Change, Part 1** This experiential workshop is for institutional researchers who wish to expand their knowledge base and abilities as change agents. We will explore group dynamics, the nature of leadership in group situations, and the facilitation of individual and organizational change. Warning: this work is fun! Workshop
2:00 - 5:00 p.m. Nassau A/B J. Fredericks Volkwein Director of Institutional Research & Assoc. Professor Educational Administration & Policy Studies SUNY-Albany	**Managing a Program of Outcomes Assessment, Part 1** This workshop acquaints institutional researchers with the tools and processes for assessing campus educational outcomes. Participants will review the multiple purposes and uses of assessment, and will learn about various methodologies and instruments that are available and appropriate. Participants should bring copies of assessment plans and reports from their own institutions where possible. Workshop
2:00 - 5:00 p.m. Colonial/University Karen Bauer Assistant Director of Institutional Research and Planning University of Delaware	**Newcomers to Institutional Research: Strategies for Effective Institutional Research, Part 1** This workshop is designed for new practitioners who engage in IR activities. Using the AIR monograph, Strategies for the Practice of Institutional Research, the workshop addresses key components of IR including defining critical issues for institutional research, identifying sources of data, developing factbooks and other reports, and conducting effective survey research for assessment and evaluation. The main focus is a presentation of general concepts and practical strategies for the implementation or continued development of effective IR at many schools, regardless of size or type. Workshop

Saturday, November 16 continued	
2:00 - 5:00 p.m. Carey R. Trevisan Director of Admissions and Records Ocean County College **CANCELLED**	**Stress Reduction for Frayed Researchers** The president expects you to drop everything to prepare for an emergency board meeting. You promised your son you'd be at the recital. A client has called three times to complain that the analysis doesn't support his prejudices -- so it must be wrong. Your C: drive is acting funny and your best analyst just gave notice. Stress -- it's part of all our lives. If we know how to manage it, our lives will be happier. This workshop will help you recognize stress in its daily forms: physical, emotional, and psychological, and will cover methods of controlling it in your day-to-day existence. Workshop
6:00 p.m.	**Reception in the Greenhouse Restaurant** Sponsored by Peterson's.
Sunday, November 17	
8:00 a.m. - 5:00 p.m.	**Conference Registration continues in the Nassau Foyer** **Vendor exhibits and demonstrations throughout the afternoon**
8:30 a.m. - noon Michael Matier and Peter Hurst Cornell University **CANCELLED**	**Facilitating Change, Part 2** Continuation; Part 1 is a pre-requisite. Workshop
9:00 a.m. - noon Nassau A/B J. Fredericks Volkwein SUNY-Albany	**Outcomes Assessment, Part 2** Continuation; Part 1 is a pre-requisite. Workshop
9:00 a.m. - noon Colonial/University Karen Bauer University of Delaware	**Newcomers to Institutional Research, Part 2** Continuation; Part 1 is a pre-requisite. Workshop

Sunday, November 17 continued	
9:00 a.m. - noon Library Mary Ann Coughlin Professor of Research & Statistics Springfield College	**Statistics for Institutional Research, Part 1** In Part 1 the very basic ideas in statistics will be covered in a way useful as an introduction or as a refresher to statistics. Descriptive statistics, sampling and probability theory as well as the inferential methods of chi square, t-test, and Pearson's r will be covered. May be taken with or without the follow-up advanced workshop. Workshop
Noon - 1:00 p.m.	**Buffet lunch in Ship's Room for Sunday workshop participants. Tickets required.**
1:00 - 3:00 p.m. Colonial/University Linda Winkler Director of Institutional Research Mount Saint Mary's College John Biter Director of Institutional Research St. Bonaventure University	**Catholic Colleges and Universities** Representatives of Catholic colleges and universities are invited to share experiences and common concerns and to plan activities of mutual benefit. Special Interest Group
1:00 - 4:00 p.m. Nassau A/B Linda Suskie Assistant to the President for Special Projects Millersville University	**Questionnaire Survey Research: What Works** This workshop serves as an introduction to planning and designing an effective paper-and-pencil survey. Topics to be discussed include planning the survey, the pros and cons of various question formats, and ensuring adequate validity and reliability and a high response rate. Visual presentations will be supplemented by group exercises and discussion. Workshop
1:00 - 4:00 p.m. Library Mary Ann Coughlin Springfield College	**Advanced Statistics for Institutional Research** This workshop will deal with advanced issues in inferential statistics. Topics such as Analysis of Variance, Factor Analysis, Multivariate Regression, and Logit/Probit models will be covered and contrasted with other statistical tools and techniques. A case study approach will be used illustrating applications of these statistical techniques in institutional research. SPSS running on a PC will be used for this workshop. Open to those who have completed the introductory workshop on Sunday morning, or who have an equivalent background. Workshop

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Sunday, November 17 continued	
1:00 - 4:00 p.m. Princeton James C. Fergerson Director of Institutional Research Bates College	**Web Basics for Institutional Researchers** This workshop will be an introduction to the basics of finding resources on the web and putting information on the web for institutional researchers. It is intended to give relative beginners some of the practical and technical background needed to locate institutional research information on the web and to set up a basic web site. It will include basic introductions to Hypertext Markup Language (HTML) and to popular HTML editing tools. The "do's and don'ts" of setting up a public web site will be discussed. Workshop
4:00 - 5:15 p.m.	**Taking Survey Research to the Next Step: Empowering Social Change** **George Gallup, Jr., President, Gallup, Inc.** **Opening Plenary Session in the Prince William Ballroom**
5:15 - 7:00 p.m.	**President's Reception in Senior Room and Assembly Area** Sponsored by Scanning Products, Inc.
5:15 - 6:00 p.m.	**Mentor's Meeting in Ship's Room**
7:00 - 10:00 p.m.	**Banquet and Entertainment in Prince William Ballroom** **Marc Abrahams, Editor, "The Annals of Improbable Research" (AIR!) and father of the Ig Nobel Prize** **Advances in Improbable Research** A seminar/slide show presenting outstandingly improbable research, a surprising amount of it genuine. The talk includes the highlights from the Ig Nobel Prize Ceremonies held annually at Harvard. Topics span the full range of sciences and beyond, including: The Taxonomy of Barney; a Spectrographic Comparison of Apples and Oranges; Tabletop Fusion and Feline Reactions to Bearded Men. Heckling is encouraged, as are lab coats and other appropriate and inappropriate regalia.

Monday, November 18	
8:00 - Noon	**Conference Registration continues in the Nassau Foyer**
7:45 - 8:45 a.m.	**Breakfast in the Ballroom; Concurrent At-Your-Service Sessions and Special Interest Groups**
7:30 - 8:45 a.m. Princeton University Faculty Club Kathleen Kern Bowman Research Associate COFHE **********	**COFHE Breakfast** A chance for COFHE schools to share ideas and concerns. Special Interest Group
8:00 - 8:45 a.m. Table 2 Alan J. Sturtz Director of Institutional Research, Planning and Assessment Gateway Community-Technical College **********	**Two-Year Colleges** Problems, concerns and issues for the IR function in two-year colleges will be shared in an informal setting. Concerns about the impending IPEDS GRS-2 survey will be a key discussion topic. Special Interest Group
8:00 - 8:45 a.m. Table 3 Marlene Arno Director of Institutional Research Erie County Community College **********	**SUNY AIRPO** Agenda includes marketing strategies that don't hurt one another; SUNY Cental assistance and the Federal Graduate Rate Survey. Special Interest Group
8:00 - 8:45 a.m. Table 4 Eleanor Swanson Director of Institutional Research Monmouth University	**NJAIR** Topics to be covered include discussion of the steering committee's proposal for formalizing the organization of NJAIR and planning for the third annual spring meeting of NJAIR.

Monday, November 18 continued	
9:00 - 9:45 a.m. Princeton Karen Froslid Research Analyst Elizabeth Sibolski Director, University Planning & Research American University	**Developing a Survey Program: Insights from the American University Experience** The presenters discuss development of a survey program. Topics to be covered: Deciding what surveys to include in a program, designing survey instruments, combining several surveys to form a program, and contributing to policy outcomes. An open exchange of ideas will provide an opportunity to learn from each other's experience. Workshare
9:00 - 9:45 Nassau A/B James W. Firnberg President Our Lady of the Lake College George Nozicka President Quantum Research Corp.	**Accessing National Science Foundation Data Over the Internet** This session will help planners and institutional researchers take advantage of the vast amount of National Science Foundation data and reports available over the Internet. Institutionally specific as well as various sub-totals of data are available. The presentation will also demonstrate projects in the planning or pilot testing stages. AYS Technical Topic
9:00 - 9:45 a.m. Senior Kathleen Keenan Director of Institutional Research Massachusetts College of Art	**Graphic Design Basics for the Institutional Research Office** The means by which most institutional research findings are communicated is still the printed page. While software has increased our ability to produce attractive, professional looking reports incorporating graphic elements, it cannot make design decisions for us. This workshare will focus on the visual dimensions of the documents we produce. Participants are invited to bring examples to share -- reports, questionnaires, brochures, etc. -- which they think represent either successful or flawed graphic design strategies for IR documents. Workshare

Monday, November 18 continued	
9:00 - 9:45 a.m. Colonial/University Barbara Sadowski Director of Planning and Institutional Research Marie Huester Charlotte Woodward Marywood College	**Fueling an Executive Information System** We will provide an overview and details of how institutional research at Marywood College creates and maintains documents and reports for an EIS. *Information on how mixed clients access* these reports, the types of information shared, security concerns and legal issues concerning information storage will be shared. Workshare
9:00 - 9:45 a.m. Ships Room Susan G. Broyles IPEDS Project Director Roslyn A. Korb Program Director National Center for Education Statistics **NEW SESSION**	**New to IPEDS: Graduation Rate Survey** This presentation will address the anticipated changes in the IPEDS data collection for 1996 and 1997 for the Graduation Rate Survey (GRS). NCES expects to pilot test the new survey this fall and implementation is planned for 1997. NCES will report on the development of the survey instruments, the current status of the pilot study, and review all versions of the forms. Audience participation is encouraged to discuss the institutional perspective, especially how the new forms will be dealt with at the institutions.
9:45 - 10:00 a.m.	**Break in the Nassau Foyer** **NEAIR is grateful for the support of its vendors. Be sure to visit their exhibits to learn about the latest products to enhance your office productivity and effectiveness.**

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Monday, November 18 continued

10:00 a.m. - noon
Princeton

Charles Abel
Dean of Graduate Studies &
Director of IR, Planning &
Assessment

Brenda Bailey
Research Specialist

Edinboro University of
Pennsylvania

ABOVE PAPER CANCELLED

10:00 - 10:30 a.m.
Anne Marie Delaney
Director of Program Research

Boston College

10:40 - 11:10 a.m.
Dawn Geronimo Terkla
Director of Institutional Research

Kelli Armstrong
Research Analyst

Tufts University

Institutional Research to Promote Institutional Effectiveness

Nominal Group Technique: What Can We Do to Improve Our Graduate Programs?

The Nominal Group Technique was utilized to identify the problems, strengths, visions and needs of graduate programs. Participants including graduate program heads, graduate studies staff, and a facilitator generated a rank-ordered list of ten priorities for improving graduate programs. Ultimately the process led to the establishment of a continuous improvement plan.

Research Paper

The Institutional Researcher as Program Evaluator: Influencing the Development of Innovative Programs

Using the evaluation of a university based, three-year inter-professional program as a case study, this paper demonstrates how institutional researchers can expand their role to include that of program evaluator and thereby influence the development of innovative academic and professional degree programs. The paper presents the models of evaluation, research design, implementation strategies, and qualitative and quantitative analysis techniques utilized in this evaluation and relevant to the evaluation of other programs.

Research Paper

Weaving Institutional Research Into the Fabric of TQM

The process of Total Quality Management involves a research component, or a point where a quality improvement team must examine prior practices and current status before recommending change. This paper examines the impact of improvement techniques like TQM on the resources of an institutional research staff and the approach that has been adopted at a Research I University.

Research Paper

Moderator: Stuart Rich, Director of Institutional Research, Georgetown University

Monday, November 18 continued	
10:00 a.m. - noon Nassau A/B	**Studies in Autonomy and Effectiveness**
J. Fredericks Volkwein, Director of Institutional Research Shaukat M. Malik Lu Chen SUNY-Albany	**The Dynamics of State Regulation and Administrative Flexibility** This is a four-part study, supported by NEAIR, that investigates the dynamics of state regulation and administrative flexibility. The study first measures the academic, personnel and financial dimensions of state regulation, as well as the changes that have occurred since 1983. Second, the study examines the relationship between regulation and various state characteristics, and tests the hypothesis that state characteristics have an effect on the level of flexibility granted to university campuses. Third, the research analyzes the relationship between regulation and campus characteristics, and tests the hypothesis that administrative and academic controls are stimulated by campus characteristics or behavior. Fourth, the research analyzes the relationship between state regulation and the levels of satisfaction among those campus managers who theoretically might be impacted by regulation. Research Paper
Anita Voogt Dutchess Community College J. Fredericks Volkwein SUNY-Albany	**Correlates of Autonomy and Institutional Effectiveness in NYS Community Colleges** A two-part study of the change in autonomy of the community colleges of the State University of New York as a result of recent legislation, and the perceived relationship between autonomy and selected measures of institutional effectiveness. Research Paper Moderator: Kent W. Smith, Institutional Researcher, Trinity College **This work is supported in part by the NEAIR Research Grant Program.**

Monday, November 18 continued	
10:00 a.m. - noon Senior	**Historical Studies to Inform Public Opinion**
10:00 - 10:30 a.m. Michael J. Dooris Director of Academic Assessment O. Richard Bundy, III Associate Director, Telefund The Pennsylvania State University	**What Price a Nittany Lion? Tuition and Fees at Penn State from 1859 to 1995** How do changing tuition and fees relate to inflationary and deflationary trends, faculty salaries, or the salaries of college graduates? How do recent developments compare to long-term historical trends? This unusual paper addresses these and similar questions for one university, Penn State, from its founding in 1859 to the 1990s. Research Paper
10:40 - 11:10 a.m. John Kraus Director of Institutional Research Antonietta Taylor Assistant Director The University of New Hampshire	**Graduation Rates at the University of New Hampshire -- An Historical Perspective** Graduation rates are a "hot button" issue. Is higher education doing as good a job of producing graduates as previously? An analysis of records from the 1920s and 1930s enables comparison of UNH rates then and now. Conclusions and implications are outlined. Research Paper
11:20 - 11:50 a.m. C. Anthony Broh Registrar Princeton University	**The Race is On** Many people are surprised to learn that the methodology for classifying people by race and ethnicity has changed with every decennial census since 1790. The 2000 census will likely continue this unbroken string of continuing change with intervening consequences for several government reporting requirements -- including IPEDS. While the changes at first glance appear rather small, together they describe the way researchers have thought about race and ethnicity since the formation of the nation. Workshare Moderator: Timothy A. Walsh, Director of Student Information, Temple University

Monday, November 18 continued	
10:00 a.m. - noon Colonial/University	**Institutional Research to Anchor Institutional Policy**
10:00 - 10:30 Alan J. Sturtz Director of Institutional Research, Planning & Assessment Gateway Community-Technical College	**Placement Test Scores and Student Persistence: Institutional Considerations for Ability to Benefit** This study tracks all new students who entered Gateway Community-Technical College since fall 1987 who were recommended for and enrolled in developmental English as the result of a standardized placement test. The focal hypothesis is that, with due consideration to "Ability to Benefit," students who test below a given level may not receive satisfactory grades in the course and may leave the college. This analysis can provide vital decision support for academic advising and course development, and scheduling and institutional policy formulation. Research Paper
10:40 - 11:10 a.m. Keith J. Guerin Director of Institutional Research & Planning County College of Morris	**Measuring the Effects of Basic Skills Policy Changes: A Multivariate Comparison of Apples and Oranges** In 1994 the New Jersey Department of Higher Education was abolished. The new governor granted colleges greater autonomy in establishing policies for remedial course requirements. This paper examines the effects of eliminating objective tests for placement, and the replacement of four remedial courses with one. Retention rates, GPAs, and performance in specific college credit courses are examined for three first-time cohorts to assess the outcome of these changes. Research Paper
11:20 - 11:50 a.m. Stephen W. Thorpe Director of Institutional Research La Salle University	**IR Influence on Marketing and Pricing Policies: First-time Graduate Student Inquiries -- Why Don't They Apply?** Institutions of higher education are expanding recruitment efforts to increase the numbers of part-time adult students. This paper presents the findings of a market research study to investigate why potential, part-time graduate students were not applying for admission. This project demonstrates the role institutional researchers can play as internal consultants. Research Paper Moderator: Kathleen Keenan, Director of Institutional Research, Massachusetts College of Art
Noon - 1:15 p.m.	**Business Luncheon in the Prince William Ballroom**

Monday, November 18 continued	
1:30 - 2:15 p.m. Princeton Rebecca Brodigan Associate Dean for Enrollment, Information Systems & Planning Bentley College	**Using ASQ+ Data to Define and Expand Your View of Your Competitors** This session will focus on developing categories of competitors using US News groupings of colleges to look at wins and losses. In addition, actual competitor data will be reviewed and the use of the data in long range budget planning will be discussed. Research Paper
1:30 - 2:15 p.m. Nassau A/B Michael McGuire Director of Research Jason Casey Research Associate Pennsylvania Independent College and University Research Center	**A Sector-Wide Survey of Faculty in Private Higher Education: One State's Thoughts on the Nature of Faculty Work and Reward Systems** This paper summarizes a large-scale survey of the full-time faculty at 50 private institutions in Pennsylvania. The results document perceived skill development and research involvement among undergraduates; the complementarity of research and teaching; high levels of faculty teaching activity, including individualized instruction; and perceived shortcomings in instructional resources and faculty reward systems. Research Paper
1:30 - 2:15 p.m. Senior Lois A. Haignere Director of Research Bonnie Eisenberg Researcher United University Professions	**Glass Ceilings and Sticky Floors in Academe? Is There Gender/Race Bias in Rank?** This study uses categorical modeling to examine gender and race bias in rank assignments at 12 SUNY institutions, four universities, four colleges and four two-year institutions. At two-year schools there is a pattern suggesting that reaching the tenured rank of Associate Professor is a glass ceiling for women. The four-year college pattern is diverse with the only discernible pattern being what appears to be a sticky floor for women and minorities in the non-tenure track rank of Lecturer. There are hurdles at most levels for three of the four universities. But the results for one university indicate much less bias than the other three, suggesting that bias can be avoided. Research Paper

Monday, November 18 continued	
1:30 - 2:15 p.m. Colonial/University Bob Adebayo Director of Institutional Research and Planning Ohio State University at Newark **CANCELLED**	**Academic Survival Needs of Disadvantaged College Students** Understanding the learning assistance needs of disadvantaged college students at the point-of-entry is one of the initial steps in developing successful intervention strategies that can eventually improve their retention rates. *This study shows that the* academic survival needs of disadvantaged college students differ by age, gender, marital status, educational background and number of years since leaving school. Research Paper Moderator: Jane Zeff, Assoc. Director Planning, Research & Evaluation, William Paterson College
2:30 - 3:15 p.m. Princeton Hershel Alexander Research & Planning Analyst Prince George's Community College	**Using Cohort Analysis to Evaluate the Impact of a Support Program for Minority Students** This paper presents spring 1995 findings about retention rates, earned credits, and grade point averages for four cohorts of first-time college students who participated in ALANA, a voluntary program that targets minority students in need of developmental work in two or three areas (English, reading, or mathematics). Research Paper
2:30 - 3:15 p.m. Nassau A/B Jishen Zhao Statistician/Analyst The College of Saint Rose	**Increasing the Utility of the College Board Standard Validity Study: A QBasic Program for Predicting an Applicant's College Performance** To increase the utility of the College Board Standard Validity Study, an MS-DOS QBasic program was developed to estimate an applicant's freshman GPA, his/her chances of earning a certain GPA or higher, and the expected utility of a select decision and a reject decision. Workshare
2:30 - 3:15 p.m. Stuart Rich Director of Institutional Research Georgetown University **RESCHEDULED ON TUESDAY MORNING**	**Faculty Educational Goals for Students and the Instruction and Evaluation Methods They Employ** Response to the 1995 HERI Faculty Survey from more than 30 selective private institutions will be examined to determine whether there are any meaningful relationships between faculty members' educational goals for undergraduate students and the types of instructional and evaluation methods they employ in their undergraduate courses. Research Paper

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Monday, November 18 continued	
2:30 - 3:15 p.m. Colonial/University Marian Pagano Associate Provost Columbia University John Pryor Coordinator of Evaluation & Research Dartmouth College	**New Approaches to Collecting Survey Responses** Three new approaches to collecting and encouraging survey response at a university are described and analyzed for statistical and financial efficiencies. Research Paper
2:30 - 3:15 Ships Room Eleanor Fujita Director of Academic Information City University of New York	**Who Does the Community College Serve? One College's Experience** In order to better understand how the community college was serving the county, a standard index was derived and "service rates" were calculated for the population based on different characteristics. The results indicated how different groups within the county were being served differentially. Workshare
3:15 - 3:45 p.m.	**Break in the Nassau Foyer: Visit Vendor Exhibits**
3:45 - 5:15 p.m. Mark Eckstein Director of Assessment & Institutional Research Bruce Hilyare Professor of English Mary Jane Heider Director of Academic Computing Genesee Community College **CANCELLED See related session Tuesday, 9:00 - 10:00**	**Curriculum Assessment at the Molar Level: Evaluating Course Objectives.** Assessing educational objectives is part of the institutional researcher's workday world. College faculty, conversely, often have little formal training in educational evaluation. By presenting the information in an unusual setting -- a four-day multimedia workshop -- an assessment professional presented sound practice without arousing the "territorial imperative" of professional teachers. Panel

Monday, November 18 continued	
3:45 - 5:15 p.m. Princeton 3:45 - 4:20 p.m. Bradley Quin Director, Admissions & Enrollment Services The College Board	**Admissions Testing** **The SAT and Recentering** This year's college bound cohort (those students who enrolled in college this fall) were the first to have their SAT I: Reasoning Test scores reported on the "new" recentered scale since the test was placed on scale in 1941. The College Board elected to undertake the necessary renorming on the heels of having successfully introduced the New SAT in the spring of 1994 and in light of the fact that the reference group taking the test today is substantially different from the testing population of 1941. This session will review the policy, technical, and communications issues associated with this change. Various reactions to recentering by College Board member institutions, the press and media, as well as public policy makers will be discussed.
4:30 - 5:05 p.m. Nancy Burton Director Development & Research Educational Testing Service **NEW SESSION**	Research Paper **Admissions Testing: Does it Have a Future?** In the final years of the twentieth century, admissions tests created in the 1920s or even the 1950s seem curiously dated. A cafeteria full of students, stacks of test books, number 2 pencils -- is there a future for this kind of testing? Is there a future for multiple-choice tests of general skills, rather than measures of very specific performances in realistic settings? Will national tests still be used, rather than assessments of specific state and district educational standards? These issues will be discussed from one test publisher's perspective. Research Paper
3:45 - 5:15 p.m. Nassau A/B 3:45 - 4:20 p.m. Tracy Hunt-White Asst. Director Planning and Institutional Research The Catholic University of America	**Retention Revisited** **Developing a Profile of Retained and Attrited Students** Implementing effective retention policies require knowledge of the academic and non-academic characteristics of returning and non-returning students. This study will develop a profile of these students using the following variables: satisfaction with college services, demographics, high school background, college choice, academic performance, institutional support, and reasons for leaving.

Monday, November 18 continued	Research Paper
4:30 - 5:05 Marcia M. Lee Director of Institutional Research Westchester Community College	**Why Students Failed to Return** Student success -- whether it be to earn a degree, transfer to a four-year college, prepare for a new career, or take courses for personal interest -- is a primary focus of a community college. In spring 1994 a survey was sent to all first-time fall 1993 freshmen who did had not returned for the spring. The results and the method used are the topic of this paper. Research Paper Moderator: Yves M. Gachette, Assistant for Institutional Research, Buffalo State College
3:45 - 5:15 p.m. Senior 3:45 - 4:20 p.m. Bruce Szelest Associate for Institutional Research SUNY-Albany 4:30 - 5:05 p.m. Timothy A. Walsh Director of Student Information Systems Temple University	**Finding Peers** **In Search of Peer Institutions: Two Methods of Exploring and Determining Peer Institutions** This paper details the use of Factor and Cluster Analysis, as well as a Composite Variable Rank method, to develop peer institution groupings for a university. A broad array of variables representing institutional dimensions of finance, size, complexity, quality, and graduate education emphasis are used. The advantages and limitations of each method are discussed, as are issues of data availability and integrity. Research Paper **Identifying Peer Institutions for Graduation Rate Comparisons** This presentation will use publicly available student measures to identify similar institutions for graduation rate comparisons. The presenter used factor analysis to identify relevant factors associated with graduation and then used cluster analysis of 1200 four-year colleges to identify 31 groups. Research Paper Moderator: Keith J. Guerin, Director of Institutional Research and Planning, County College of Morris

Monday, November 18 continued	
3:45 - 5:15 p.m. Colonial/University 3:45 - 4:20 Robert Heffernan Institutional Research & Planning Tina Grycenkov Paul Snyder Rutgers University 4:30 - 5:05 p.m. Robert K. Toutkoushian Executive Director, Office of Policy Analysis University System of New Hampshire	**Ratings and Their Meaning** **Working with the NRC Data on Graduate Programs in the U.S.: Considerations and Concerns.** Working with data from the recently published NRC report provides the institutional researcher with a rich repository of data that can be used to influence the discussion on the quality of American doctoral education. Some of the uses and problems, along with some of the findings, of working with these data are presented. Workshare **The NRC Graduate Program Ratings: What Are They Measuring?** In this paper, we analyze the graduate program ratings derived from the 1993 National Research Council (NRC) survey. We show that the ratings are influenced by a series of faculty, institutional, and student characteristics. We also compare and contrast program ratings for scholarly quality and program effectiveness. Research Paper Moderator: Stephen W. Thorpe, Director of Institutional Research, La Salle University

Tuesday, November 19	
7:30 - 9:00 a.m.	**Breakfast in the Prince William Ballroom; Concurrent At-Your-Service Sessions and Special Interest Groups**
8:00 - 8:50 a.m. Table 1 Ellen Armstrong Kanarek Vice President Applied Educational Research, Inc. **********	**ASQ and ASQ+ Users Group** An opportunity for those interested in the Admitted Student Questionnaire, or Admitted Student Questionnaire Plus, to discuss their experiences, have their questions answered, get help on specific analyses of your ASQ/ASQ+ data, and learn what changes may be planned. Special Interest Group
8:00 - 8:50 a.m. Table 2 Lynn Rothstein Executive Associate to the President Union Theological Seminary Mary Jean Whitelaw Carnegie Foundation for the Advancement of Teaching Peter Syverson Council for Graduate Schools **********	**Questionnaire Development: Maximizing Information Within the Institution, Over Time and Across Disciplines.** Sharing questionnaire development and content is the focus of this session. Instruments were developed to maximize information within an institution (students, faculty, deans, alumni), over time (entering, continuing, exiting students, alumni), and across disciplines (i.e., English, mathematics, political science). This material is useful to both graduate and undergraduate institutions. AYS-Table Topic
8:00 - 8:50 a.m. Table 3 Jane Zeff Assoc. Director of Planning, Research & Evaluation William Paterson College Eleanor Fujita	**Expanding the Audience for IR Information.** Examples of several formats will be distributed and serve as a basis for discussion about how and why these reports were produced and some of the reactions the reports have received. AYS-Table Topic

Tuesday, November 19 continued	
7:30 - 9:00 a.m., continued	**Breakfast in the Prince William Ballroom, continued; Concurrent At-Your-Service Sessions and Special Interest Groups**
8:00 - 8:50 a.m. Senior Room James F. Trainer Director Higher Education Data Sharing Consortium	**Higher Education Data-Sharing Consortium** An opportunity for HEDS members and others interested in data exchange activities to discuss current issues and concerns. Special Interest Group
**********	
8:00 - 8:50 a.m. Table 4 Denise A. Krallman Institutional Research Analyst Miami University of Ohio	**Focus Group I: The Princeton Conference** A focus group to elicit information on the strengths and weaknesses of this year's conference, led by the program chair of next year's conference. By invitation. AYS-Table Topic
**********	
8:00 - 8:50 a.m. Table 5 Robert A. Yanckello Assistant Director of Planning Central Connecticut State University	**Focus Group II: The Princeton Conference** A focus group designed to elicit information on the strengths and weaknesses of this year's conference, led by the local arrangement's chair for next year's conference. By invitation. AYS-Tabie Topic
9:00 - 10:00 a.m. Princeton Charles Border Coordinator, Institutional Research D'Youville College **CANCELLED**	**Decision Making in Higher Education: A Many Sided Coin** A qualitative research study was conducted at a SUNY college to gather information regarding the perceptions of the faculty and administration of their role in the decision making process. The results show how important it is for IR practitioners to consider more than quantitative techniques when approaching a policy question. Research Paper

Tuesday, November 19 continued	
9:00 - 10:00 a.m. Nassau A/B Anne Marie Delaney Director of Program Research Boston College	**Comparative Perspectives on the Role of Institutional Research: Variation by Institutional Characteristics** Based on a survey of 243 New England colleges and universities, this paper presents results from bivariate and multivariate analyses showing the relationships among the following: institutional characteristics, the nature of the institutional research function and the kind of research performed, the contribution of institutional research to decision making, the vision for the role of institutional research and the estimated resources required to fulfill this vision. Research Paper **Recipient of the "Best Paper" award at the Burlington Conference, 1995.** Moderator: Bob Adebayo, Director of Institutional Research and Planning, Ohio State University at Newark
9:00 - 10:00 a.m. Brenda Bailey Coordinator of Institutional Research Edinboro University of Pennsylvania **CANCELLED**	**Student-Centered No Show Study** In the 1980s institutional research regularly surveyed "no show" students and produced reports aimed at improved marketing. This current study focusses not on marketing, but on what a university can do to become more student-centered and encourage accepted students to matriculate. Topics suggested by parents for improvement will be further assessed as part of the continuous improvement process. Research Paper
9:00 - 10:00 a.m. Senior Stuart Rich Director of Institutional Research Georgetown University	**Faculty Educational Goals for Students & Instruction& Evaluation Methods They Employ** Response to the 1995 HERI Faculty Survey from more than 30 selective private institutions will be examined to determine whether there are any meaningful relationships between faculty members' educational goals for undergraduate students and the types of instructional and evaluation methods they employ in their undergraduate courses. Research Paper

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Tuesday, November 19 continued	
9:00 - 10:00 a.m. Colonial/University Mark Eckstein Director of Assessment & Institutional Research Genesee Community College	**Curriculum Assessment at the Molecular Level: Evaluating Course Objectives.** Assessing educational objectives is part of the institutional researcher's workday world. College faculty, conversely, often have little formal training in educational evaluation. By presenting the information in an unusual setting -- a four-day multimedia workshop -- an assessment professional presented sound practice without arousing the "territorial imperative" of professional teachers. Workshare
9:00 - 10:00 a.m. Bayard Baylis Associate Dean Messiah College **CANCELLED**	**Taking Values Seriously: What's All This Data Telling Us?** This multi-year project uses quantitative and qualitative means with students, alumni and faculty to determine how well colleges are doing in shaping the values of their students. This paper presents baseline data and early comparative results from the first two years of the project. Research Paper
10:00 - 10:30 a.m.	**Break in the Nassau Foyer**
10:30 a.m. - Noon Ballroom Jack Dunn Terry Hartle Vice President for Government Relations, American Council on Education Richard Spies Financial Vice President Princeton University	**Thoughts of One's Own: Speculations about What the Future Holds for Higher Education and Implications for the Practice of Institutional Research** Moderator: Sandy Johnson, Assistant Dean of the Faculty, Princeton University Closing Plenary Session
Noon - 4:30	**Luncheon and Meeting of the Steering Committee in Ships**

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Hershel Alexander
Rsch/Plng Analyst
Prince George's Comm Coll
Kent Hall 230
301 Largo Rd
Largo, MD 20774-2199
301-322-0741
301-808-0960
HA2@PGSTUMAIL.PG.CC.MD.US
P

Catherine Alvord
Data Analyst
Cornell Univ
440 Day Hall
Ithaca, NY 14853-2801
607-255-7546
607-255-4612
CJA2@CORNELL.EDU
P

Jean Anderson
Registrar/Dir, IR
King's College
133 N River St
Wilkes-Barre, PA 18711
717-826-5870
717-825-9049
jpanders@rs02.kings.edu
F

Tommy Annas
Asst Provost, IR
SUNY-Central Admin
Inst Rsch & Anlytic Stds
State University Plaza
Albany, NY 12246
518-443-5639
518-443-5632
annast@sysadm.suny.edu
P

Kelli Armstrong
Research Analyst
Tufts Univ
28 Sawyer Ave
Medford, MA 02155
617-628-5000 X5246
617-627-3993
KARMSTRONG@INFONET.TUFTS.EDU
P

Wayne S Arndt
Director, IR
Georgian Court Coll
900 Lakewood Ave
Lakewood, NJ 08701-2697
908-364-2200 X238
908-367-3920
warndt@georgian.edu
F

Sister Virginia Assumpta
Director, IR & Planning
Immaculata College
P.O. Box 702
Immaculata, PA 19345-0702
610-647-4400 X3147
610-251-1668
P

Lawrence Baldwin
Director, Operations
Wellesley College
106 Central St
Wellesley, MA 02181
617-283-3183
617-283-3663
LBALDWIN@WELLESLEY.EDU
P

K Tracy Barnes
Asst Dean, Curricular Rsch
Brown Univ
PO Box K
Providence, RI 02912
401-863-1914
401-863-7542
katharine_barnes@brown.edu
P

Karen Bauer
Asst Director, Instl R&P
Univ of Delaware
325 Hullihen Hall
Newark, DE 19716
302-831-2021
302-831-8530
KAREN.BAUER@MVS.UDEL.EDU
P

Connie Beale
Dir, Quant Analysis
Seton Hall Univ
Planning Office
South Orange, NJ 07079
201-761-9401
201-761-9793
BEALECON@LANMAIL.SHU.EDU
F

Cheryl Beil
Dir, Enrlmt Rsch/Ret
George Washington Univ
Suite 102
2121 Eye St, NW
Washington, DC 20052
202-994-6712
202-994-0357
cbeil@gw152.circ.gwu.edu
P

Susan Bello
Instl Rsch
Nassau CC
1 Education Dr
Garden City, NY 11530
516-572-8160
M

Elizabeth Beraha
Programmer/Analyst
Boston Univ
2nd Fl, Rm 244
881 Commonwealth Ave
Boston, MA 02215
617-353-9094
617-353-7300
erlejb@uism.bu.edu
M

Craig S. Billie
Assoc. for IR
SUNY-Central Admin
State University Plaza
Room 309
Albany, NY 12246
518-443-5639
518-443-5632
billiecs@sysadm.suny.edu
P

Felice D. Billups
Director, IR
Rhode Island School of Design
2 College St.
Providence, RI 02903
401-454-6334
401-454-6406
M

Peter Blanchfield
Asst Director, IR
Hamilton College
198 College Hill Rd
Clinton, NY 13323
315-859-4045
315-859-4185
PBLANCHF@HAMILTON.EDU
P

Marilyn H. Blaustein
Director, IR
UMASS-Amherst
237 Whitmore Building
Box 38190
Amherst, MA 01002
413-545-0941
413-545-3010
BLAUSTEIN@OIRP.UMASS.EDU
P

Gary Blose
Associate for IR
SUNY-Central Admin
State University Plaza
Albany, NY 12246
518-443-5639
518-443-5632
blosegl@sysadm.suny.edu
V097J3E5@UBVMS.CC.BUFFALO.EDU
P

Charles Border
Coordinator, IR
D'Youville College
320 Porter Ave
Buffalo, NY 14201
716-881-7727
716-881-7790

M

Karl Boughan
Supervisor, IR
Prince George's Comm Coll
301 Largo Rd K-231
Largo, MD 20774
301-322-0722
301-808-0960
KB2@PGSTUMAIL.PG.CC.MD.US
P

Kathleen Kern Bowman
Research Associate
COFHE
238 Main Street, Suite 307
Cambridge, MA 02142
617-253-5032
617-258-8280
KKERN@MIT.EDU
P

David Breen
VP Plng/Admin
Merrimack College
315 Turnpike St
North Andover, MA 01845
508-837-5231
508-837-5222
DBREEN@MERRIMACK.EDU
M

Brenda Bretz
Assistant Registrar
Dickinson College
P O Box 1773
Carlisle PA 17013
717-245-1316
717-245-1534
BRETZ@DICKINSON.EDU
P

Rebecca Brodigan
Director, Plng/Rsch
Vermont State Colleges
PO Box 359
Waterbury, VT 05676-0359
802-241-2520
802-241-3369
brodiganr@quark.vsc.edu
P

C Anthony Broh
Registrar
Princeton Univ
101 West College
Princeton, NJ 08502
609-258-6191
609-258-6328
broh@princeton.edu
F

Jennifer A. Brown
Exec Officer, Ac Aff/Rsch
Connecticut State Univ System
39 Woodland St
Hartford, CT 06105-2337
860-493-0074
860-493-0080
BROWNJ@CSUSYS.CTSTATEU.EDU
P

O. Richard Bundy, III
Dir., Telefund Operations
Penn State
112 S Burrowes St
State College, PA 16801
814-863-3935
orb100@psu.edu
F

Nancy Burton
Director, Rsch&Dev
Educational Testing Service
Carter Road
Princeton, NJ 08541
609-683-2288
609-683-2280
nburton@ets.org
S

Kathleen M Busch
Asst to President
Assoc of Ind Col & Univ NJ
797 Springfield Ave
Summit, NJ 07901
908-277-3738
908-277-0851
MAIL07713@POP.NET
M

BEST COPY AVAILABLE

Rita Catalano
Director, Grants & Research
St Vincent College of PA
300 Fraser Purchase Rd
Latrobe, PA 15650-2690
412-537-4562
412-537-4587
RCATALANO@STVINCENT.EDU
F

Rena Cheskis-Gold
Sr Rsch Analyst
Yale Univ
246 Church St
PO Box 208289
New Haven, CT 06520-8289
203-432-1331
203-432-1754
RENA.CHESKIS-GOLD@YALE.EDU
P

Salvatore Ciolino
Director, Instl Analysis
Gettysburg College
325 Table Rock Rd
Gettysburg, PA 17325
717-337-6582
717-337-6008
SCIOLINO@GETTYSBURG.EDU
P

Craig A. Clagett
Director, IR & Analysis
Prince George's Comm Coll
301 Largo Road, K-231
Largo, MD 20774
301-322-0723
301-808-0960
CC5@PGSTUMAIL.PG.CC.MD.US
P

Margaret K. Cohen
Asst VP for Instl Rsch
George Washington Univ
Rice Hall, Suite 809
Washington, DC 20052
202-994-6509
202-994-0709
SISMKC@GWUNIX2.GWU.EDU
P

Fred Cohen
Dir, Enrlmt Rsch/Analysis
New York Univ
Suite 615
7 East 12th Street
New York, NY 10003-4475
212-998-4415
212-995-4095
FRED.COHEN@NYU.EDU
P

Corby A Coperthwaite
Director, IR
Manchester Comm-Tech College
60 Bidwell St
PO Box 1046
Manchester, CT 06045-1046
860-647-6101
860-647-6332
MA_CORBY@COMMNET.EDU
P

Mary Ann Coughlin
Professor, Rsch/Stats
Springfield College
Alden St
Springfield, MA 01109
413-748-3038
413-748-3537
mary_coughlin@spfldcol.edu
P

Paula Cox
Sr Rsch Officer/IR
Rice Univ
Suite 200, MS95
5620 Greenbriar
Houston, TX 77005
713-831-4700
713-831-4747
pncox@rice.edu
F

Diane Cuneo
Director, IR
Smith College
Office of Instl Res
Northampton, MA 01063
413-585-3022
413-585-3026
DCUNEO@SMITH.SMITH.EDU
P

Cherry Danielson
Graduate Rsch Asst
Univ of Michigan
582 South Seventh St
Ann Arbor, MI 48103
313-747-8849
CHERRYD@UMICH.EDU
P

Arlene Danville
Assoc Director, IR
Pace Univ
1 Pace Plaza
New York, NY 10038
212-346-1429
212-346-1041
danville@ny2.pace.edu
F

David L. Davis-Van Atta
Director, IR
Carleton College
One N College St
Northfield, MN 55057
507-646-4292
507-646-4540
DDAVISVA@ACS.CARLETON.EDU
P

Anne Marie DeLaney
Director, Program Research
Boston College
Campion Hall 336A
Chestnut Hill, MA 02167
617-552-0682
617-552-8419
DELANEYA@HERMES.BC.EDU
P

Karen DeMonte
Research Analyst
Univ of Delaware
Office of IR
325 Hullihen Hall
Newark, DE 19716
302-831-2021
302-831-8530
karen.demonte@mvs.udel.edu
F

Kimberley Dolphin
Coordinator, IR
Bentley College
175 Forest St
Waltham, MA 02154
617-891-2551
617-891-2569
KDOLPHIN@BENTLEY.EDU
P

Michael Dooris
Dir, Acad Assessment
Penn State Univ
417 Old Main
University Park, PA 16802
814-863-1864
814-863-7452
mjd1@psu.edu
P

Scott Drakulich
Director, IR
Essex Co Coll
303 University Ave
Newark, NJ 07737
201-877-3370
201-623-6449
DRAKULI@PILOT.NJIN.NET
F

John A. Dunn, Jr.
Executive Director
Mt Washington Observatory
PO Box 294
Jackson, NH 03846
603-383-6615
603-383-6615
JDUNN@TIAC.NET
P

Jeffrey Dutton
Assistant Provost
SUNY-Buffalo
406 Capen Hall
Box 601603
Buffalo, NY 14260-1603
716-645-2791
716-645-3799
DUTTON@MSMAIL.BUFFALO.EDU
P

Mark A. Eckstein
Dir, Assess & IR
Genesee Comm Coll
One College Road
Batavia, NY 14020
716-343-0055 X6549
716-343-4541
marke@sgccvb.sunygenesee.cc.ny.us
P

Rhoda Epstein
Director, IR
Sullivan Co CC
1000 Leroy Rd
Loch Sheldrake, NY 12759
914-434-5750 X221
914-434-4806
F

Barbara Erdsneker
Asst Director, IR
Bergen Comm Coll
400 Paramus Road
Paramus, NJ 07652
201-447-9207
201-445-8532
erdsnek@email.njin.net
P

Ayshe Ergin
Director, IR
The College of New Jersey
Green Hall 101
Hillwood Lakes, CN 4700
Trenton, NJ 08650-4700
609-771-2797
609-771-3484
ergina@tcnj.edu
F

Marilyn Feingold
Asst Dean, IR
Camden County College
PO Box 200
Blackwood, NJ 08012
609-374-4932
609-374-4892
Feingold@pilot.njin.net
P

James C. Fergerson
Director, IR
Bates College
2 Andrews Road
Lewiston, ME 04240-6028
207-786-8210
207-786-6123
JFERGERS@ABACUS.BATES.EDU
P

James Firnberg
President
Our Lady of the Lake College
5345 Brittany Dr
Baton Rouge, LA 70808
504-768-1710
504-768-1726
JFIRNBERG@OLOLCOLLEGE.CCLA.US
F

Phyllis A. Fitzpatrick
Director, Mgmt Info
Fairfield Univ
1073 N Benson Rd
Fairfield, CT 06430-5195
203-254-4000 x2774
203-254-4007
PFITZPATRICK@FAIR1.
FAIRFIELD.EDU
P

Thomas Frank
Director, IR
Providence College
River Ave & Eaton St
Providence, RI 02918-0001
401-865-2723
401-865-2236
tfrank@providence.edu
F

Nurit Friedman
Data Services Manager
Villanova Univ
800 Lancaster Ave
Villanova, PA 19085
610-519-7320
610-519-7162
NFRIEDMA@EMAIL.VILL.EDU
P

Karen Froslid
Asst Dir, Univ Plng/Rsch
American Univ
4900 Massachusetts Ave, NW
Washington, DC 20016
202-244-8180
202-885-3273
KFROSLI@AMERICAN.EDU
F

Eleanor Fujita
Director, Acad Info
City Univ of NY
155 Calhoun Ave
New Rochelle NY 10801
212-794-5556
212-794-5706
elfbh@cunyvm.cuny.edu
P

Rhonda Gabovitch
Director, IR
Massasoit CC
1 Massasoit Blvd
Brockton, MA 02402
508-588-9100 X1705
508-427-1205
RGABOVITCH@MECN.MASS.EDU
P

Yves M. Gachette
Asst for IR
Buffalo State College
1300 Elmwood Ave
Buffalo, NY 14222
716-878-4521
716-878-3140
F

Gary Gaffield
Asst Prov, Ac Prog
Wittenberg Univ
PO Box 720
Springfield, OH 45501
513-327-7922
513-327-6340
gaffield@wittenberg.edu
F

Janice A Gifford
Assoc Dean of Faculty
Mount Holyoke College
102 Mary Lyon Hall
South Hadley, MA 01075
413-538-2874
413-538-2391
jgifford@mtholyoke.edu
F

Lorraine Gill
Asst to Pres, IR
Eastern Nazarene College
23 E Elm Ave
Quincy, MA 02170
617-745-3486
617-745-3490
gilll@enc.edu
M

Ivan Gonzalez
Senior Analyst
Columbia Univ
211 Low Memorial Library
New York, NY 10027
212-854-3073
212-854-9493
igi7@columbia.edu
P

Jerene Good
Director, IR
Drexel Univ
3141 Chestnut St
Philadelphia, PA 19104-2875
215-895-1843
215-895-1508
JERENE@DUVM.OCS.DREXEL.EDU
P

Indira Govindan
Director, IR
Drew Univ
36 Madison Ave
Madison, NJ 07940
201-408-3636
201-408-3038
IGOVINDA@DREW.EDU
P

Helen Gradisar
Director, IR
Carlow College
3333 Fifth Avenue
Pittsburgh, PA 15213
412-578-6077
412-578-8710
M

Rosalinda Graham
Sr. Research Analyst
Univ of Delaware
334 Hullihen Hall
Newark, DE 19711
302-831-6283
302-831-8530
ROSALINDA.GRAHAM@
MMVS.UDEL.EDU
P

Richard Grakowsky
Technical Asst
Monroe CC
1000 East Henrietta Rd
Rochester, NY 14623-5780
716-292-3033
716-427-2749
GRAKOWSK@MCCVM.IS.MONROECC.EDU
F

Joseph Grasso
Dir, Budget/IR/Plng
Colgate Univ
13 Oak Dr
Hamilton, NY 13346
315-824-7455
315-824-7861
JGRASSO@CENTER.COLGATE.EDU
F

Martha Gray
Director, IR
Ithaca College
340 Job Hall
Ithaca, NY 14850-7010
607-274-3164
607-274-1500
mgray@ithaca.edu
P

Tina Grycenkov
Info Mgr
Rutgers Univ
Geology Hall, 1st Fl
New Brunswick, NJ 08903
908-932-7305
908-932-1268
GRYCENKOV@INSTLRES.RUTGERS.EDU
P

Jean Gubbins
Program Mgr, Public Affairs
Case Western Reserve Univ
10900 Euclid Ave
Cleveland, OH 44106-7021
216-368-5557
216-368-6674
JEG2@PO.CWRU.EDU
M

Keith J. Guerin
Director, IR/Plng
County College of Morris
214 Center Grove Rd
Randolph, NJ 07869
201-328-5056
201-328-5053
KGUERIN@CCM.EDU
P

Heather Haberaecker
VP Finance & Admin
Clarion Univ of PA
218 Carrier Hall
Clarion, PA 16214
814-226-2240
814-226-1826
O

Lois Haignere
Director of Research
United University
Professions
159 Wolf Rd
Albany, NY 12205
518-458-7935
518-459-3242
HAIGNER@ALBANY.NET
P

Michael Haines
Director, IR/Plng/Assmt
Dominican College
470 Western Hwy
Orangeburg, NY 10962
914-359-7800 x359
914-359-2313
MH125@COLUMBIA.EDU
P

Gary Hammon
Univ of Massachusetts
150 Whitmore Bldg
Amherst, MA 01075
413-545-3995
413-545-3205
G.HAMMON@DPC.UMASSP.EDU
P

Martha Hayden
Senior Programmer Analyst
Brown Univ
Box K
Providence, RI 02912
401-863-2386
401-863-7542
martha_hayden@brown.edu
F

Richard C. Heck
Ex Officer/Dean of College
Dartmouth College
Box 6003
Hanover, NH 03755
603-646-3800
603-646-1405
R.HECK@DARTMOUTH.EDU
P

Robert J. Heffernan
Assoc Dir, IR
Rutgers Univ
Office of Ac Plng & IR
Geology Hall, 1st Fl
New Brunswick, NJ 08903
908-932-7305
908-932-1268
HEFFERNAN@INSTLRES.RUTGERS.EDU
P

Michael H Heiberger
Director, Plng/Eval
SUNY-College of Optometry
100 E 24th St
New York, NY 10010
212-780-5097
212-780-4949
heiberg@sunyopt.edu
F

David Hemenway
Director, Plng & IR
Eastern CT State Univ
83 Windham St
Willimantic, CT 06226

860-465-5306
860-465-4485
hemenwayd@ecsuc.ctstateu.edu
P

Ann Henderson
Registrar & Dir, IR
Skidmore College
815 North Broadway
Saratoga Springs, NY
12866-1632
518-584-5000 X2210
518-584-7963
AHENDERS@SKIDMORE.EDU
P

Gail Hermosilla
Director, Plng/IR
Dutchess CC
53 Pendell Road
Poughkeepsie, NY 12601
914-431-8680
914-431-8984
hermosil@SUNYDutchess.edu
M

Jeffery J. Himmelberger
Admissions Rsch Analyst
Clark Univ
950 Main St
Worcester, MA 01610
508-793-7374
508-793-7500
JHIMMELBERGE@VAX.CLARKU.EDU
P

Larene Hoelcle
Dean, Human Res/Plng
Genesee Comm Coll
One College Road
Batavia, NY 14020
716-345-6811
716-343-4541
LARENEH@SGCCVB.SUNYGENESEE.CC.NY.US
M

Kimberly Hoeritz
Dir., Rsch for Higher Ed
Peterson's
202 Carnegie Center
Princeton, NJ 08543-2123
V

Marie Huester
Asst Director, IR
Marywood College
2300 Adams Ave
Scranton, PA 18509-1598
717-348-6203
717-348-1899
huester@ac.marywood.edu
P

Tracy Hunt-White
Assoc Director, Plng/IR
Catholic Univ of America
Cardinal Station PO
Washington, DC 20064
202-319-6425
202-319-6690
HUNTT@CUA.EDU
P

Sherrill Ison
Director, IR
Monroe Comm Coll
1000 E. Henrietta Rd.
Rochester, NY 14623
716-292-3032
716-427-2749
ison@mccvm.is.monroecc.edu
P

Sally Jack
Assoc for IR
SUNY-Central Admin
State University Plaza
Albany, NY 12246
518-443-5639
518-443-5632
JACKSE@SNYCENVM
P

Robert Jalbert
Director of Research
Norwalk Community-Tech College
188 Richards Avenue
Norwalk, CT 06854
203-857-7081
203-857-7297
NK_JALBERT@COMMNET.EDU
P

Jennifer Jilek
Rsch Statistician
Univ of Pittsburgh
2nd Fl, Bruce Hall
Pittsburgh, PA 15260
412-648-7148
412-648-8815
jilek@oafa.pitt.edu
M

Sandra Johnson
Asst Dean of the Faculty
Princeton Univ
Room 304 Nassau Hall
Princeton, NJ 08544-5264
609-258-5230
609-258-2518
SANDYJ@PRINCETON.EDU
P

Tom Jones
President
Scanning Products, Inc
11402 Gayton Rd
Richmond, VA 23233
V

Ellen Armstrong Kanarek
Vice President
Applied Educational Research, Inc.
100 Thanet Circle
Princeton, NJ 08540
609-924-0464
609-924-2025
KANAREK@PUCC.PRINCETON.EDU
P

Kathleen A. Keenan
Director, IR
Mass. College of Art
621 Huntington Ave
Boston, MA 02115
617-232-1555 X242
617-232-0050
KKEENAN@MECN.MASS.EDU
P

Robert L Kegebein III
Rsch Analyst
Corning CC
1 Academic Dr
Corning, NY 14830
607-962-9211
607-962-9246
kegebein@scccvc.corning-cc.edu
F

John Kelley
Exec Dir, Plng/IR
Villanova Univ
800 Lancaster Ave
Villanova, PA 19085-1699
610-519-4835
610-519-7162
kelley-j@email.vill.edu
P

Gurvinder K Khaneja
Research Asst
Union Co Coll
1033 Springfield Ave
Cranford, NJ 07016-1599
908-709-7508
908-709-0827
KHANEJA@HAWK.UCC.EDU
F

Robyn Dickinson-Kiefer
Director, IR
Lehigh Carbon Comm Coll
4525 Education Park Dr
Schnecksville, PA 18078
610-799-1592
610-799-1187
ROBYNDK@AOL.COM
P

Yun K. Kim
Director, IR
Charles Co CC
PO Box 910
La Plata, MD 20646
301-934-7620
301-934-7679
yunk@charles.cc.md.us
P

Richard L. Kline
Director, IR
California Univ of PA
250 University Ave
California, PA 15419-1394
412-938-4265
412-938-4265
KLINE@CUP.EDU
P

Denise A. Krallman
Instl Rsch Analyst
Miami Univ-Oxford
Budgeting/Planning/Analysis
213 Roudebush Hall
Oxford, OH 45056
513-529-7095
513-529-2121
krallmda@muohio.edu
P

Arthur Kramer
Director, IR
Jersey City State Coll
2039 Kennedy Blvd
Jersey City, NJ 07305-1597
201-200-2499
201-200-3141
akramer@jcs1.jcstate.edu
P

John Kraus
Director, IR
Univ of New Hampshire
20 Rosemary Lane
Palmer House
Durham, NH 03824-3537
603-862-2410
603-862-3853
J_KRAUS@UNHN.UNH.EDU
P

Jeffrey Kuenzi
Research Analyst
Smith College
207 Clark Hall
Northampton, MA 01063
413-585-3045
jkuenzi@ais.smith.edu
F

Linda Lam
Policy Rsch Officer
NJ Council Co Coll
330 West State St
Trenton, NJ 08618
609-392-3434
609-392-8158
LAMLINDA@AOL.COM
F

Robert D Larsson
Consultant
2492 McGovern Dr
Niskayuna, NY 12309-2434
518-393-0332
M

David Lasky
Director, IR
Lebanon Valley College
Annville, PA 17003
717-867-6204
717-867-6075
LASKY@LVC.EDU
P

Marcia M. Lee
Director, IR/Plng
Westchester Comm Coll
75 Grasslands Road
Valhalla, NY 10595
914-785-6589
914-785-6565
P

Linda LeFauve
Director, IR
Middlebury College
Middlebury, VT 05753
802-443-5871
802-443-2067
lefauve@msmail.buffalo.edu
P

John Lewis
Research Associate
Georgetown Univ
303 Maguire Hall
Washington, DC 20057
202-687-3416
202-687-3935
LEWIS@GUNET.GEORGETOWN.EDU
P

Alberta Lipson
Assoc Dean for Research
MIT
18 Vassar St 20B-140
Cambridge, MA 02139
617-253-8604
617-253-0055
LIPSON@MIT.EDU
P

Ruth Loescher
Research Asst
Harvard Univ
453 Holyoke Ctr
Cambridge, MA 02140
617-496-3568
617-495-2900
ruth_loescher@harvard.edu
F

Wendell G. Lorang
Assoc. Dir. IR
SUNY-Albany
Admin 242
1400 Washington Ave
Albany, NY 12222
518-442-5412
518-442-5418
WGL55@CNSIBM.ALBANY.EDU
P

Nancy Ludwig
Asst Director, IR
Northeastern Univ
360 Huntington Ave
401 Church Hall
Boston, MA 02115
617-373-5100
617-373-5106
NLUDWIG@NEU.EDU
P

Qing Lin Mack
Asst for IR
Connecticut State Univ System
39 Woodland St
Hartford, Ct 06105-2337
860-493-0075
860-493-0080
mackq@csusys.ctstateu.edu
P

Joel F. Mack
Director, Info Tech
Saint Joseph College
1678 Asylum St
West Hartford, CT 06117
860-232-4571 X244
860-233-5695
JMACK@MERCY.SJC.EDU
M

Kenneth G. MacKenzie
Assoc. Dir. Enrl/Plan/Retention
Boston Univ
2nd Fl, Rm 244
881 Commonwealth Ave
Boston, MA 02215
617-353-4177
617-353-7300
kmackenz@uixm.bu.edu
M

Shaukat M Malik
Graduate Student
SUNY-Albany
Admin 241
1400 Washington Ave
Albany, NY 12222
F

Michael Matier
Assoc Dir, IR/Plng/Rsch
Cornell Univ
440 Day Hall
Ithaca, NY 14853-2801
607-255-7009
607-255-4612
mwm5@cornell.edu
M

Marie Paulette Matis
Staff Asst, IR
Rutgers Univ
Geology Hall
1st Fl
New Brunswick, NJ 08903
908-932-7305
908-932-1260
MATIS@INSTLRES.RUTGERS.EDU
F

John W. McDermott
Vice Pres for Plng & Enrollment
Moravian College
1200 Main Street
Bethlehem, PA 18018-6650
610-861-1555
610-861-3919
MEJWM01@MORAVIAN.EDU
P

Michael McGuire
Director of Research
PICURC
Suite 404
800 N Third St
Harrisburg, PA 17102
717-232-8649
717-233-8574
mcguire@picurc.org
P

Catherine McKenna
Asst VP, Plng/Tech Serv
Holy Family College
Grant & Frankford Ave
Philadelphia, PA 19114-2094
215-637-7700 X407
215-637-7700
MCKENNA@HSLC.ORG
M

Larry W. Metzger
Dean, Enrollment Plng
Ithaca College
340 Job Hall
Ithaca, NY 14850-7010
607-274-1555
607-274-1500
METZGER@OA.ITHACA.EDU
P

Billie Miles
Assoc Dir, Info Tech
Saint Michael's College
Winooskie Park
Colchester, VT 05439
802-654-2930
802-654-2422
BMILES@SMCVT.EDU
F

Aghajan Mohammadi
Director, IR
Capital Comm-Tech Coll
Asnuntack Comm-Tech Coll
401 Flatbush Ave
Hartford, CT 06106-3798
860-987-4882
860-987-4822
mohammadi@commnet.edu
F

Kathleen M. Morley
Admin Intern
UMASS-Amherst
237 Whitemore Admin Bldg
Amherst, MA 01003
413-545-5145
413-545-3010
KMORLEY@SOC.UMASS.EDU
M

Joseph Morreale
Vice Provost Plng/Assmt/IR
Pace Univ
1 Pace Plaza, Rm T510
New York, NY 10038
212-346-1010
212-346-1041
morreale@pacevm.dac.pace.edu
F

Ray Mullins
Sr. Systems Analyst
Boston Univ
2nd Fl, Rm 244
881 Commonwealth Ave
Boston, MA 02215
617-353-5170
617-353-7300
erlrrm@bu.edu
M

Peter J. Murray
Chief Info Officer
Catholic Univ of America
Cardinal Station PO
Washington, DC 20064
202-319-5373
202-319-6690
MURRAYP@CUA.EDU
P

Kathleen Nazar
Sr Rsch Analyst
Villanova Univ
800 Lancaster Ave
Villanova, PA 19085-1699
610-519-6976
610-519-7162
P

Randy Nehila
Special Studies Analyst
Boston Univ
2nd Fl, Rm 244
881 Commonwealth Ave
Boston, MA 02215
617-353-4113
617-353-7300
erlrsn@bu.edu
M

Thomas Nelson
Assst Dean/Acad Affairs
Schenectady Co CC
78 Washington Ave
Schenectady, NY 12305
518-381-1374
518-346-7511
nelsontj@gw.sunysccc.edu
P

Helene Nemeth
Asst Director
William Paterson Coll
358 Hamburg Turnpike
PO Box 913
Wayne, NJ 07470-0913
201-595-2378
201-595-3598
nemethh@gw.wilpaterson.edu
F

Elizabeth B. Nolan
Director, Instl Plng/Rsch
Siena College
515 Loudon Road
Loudonville, NY 12211-1462
518-783-2380
518-783-4293
ENOLAN@SIENA.EDU
P

Mike Novakowski
SCANTRON
5793 Wide Waters Parkway
Dewitt, NY 13214
V

Patricia M O'Brien
Director, IR
Bridgewater State Coll
Boyden Hall
Bridgewater, MA 02325
508-697-1295
508-279-6106
pobrien@bridgew.edu
F

Carl H Ostermann
Rsch Analyst
Univ of Pennsylvania
Box 3, College Hall
Philadelphia, PA 19104
215-573-5842
215-573-5839
osterman@dolphin.upenn.edu
F

Marian F. Pagano
Associate Provost
Columbia Univ
211 Low Memorial Library
New York, NY 10025
212-854-2473
212-854-9493
MFP3@COLUMBIA.EDU
P

Barbara H. Palmer
Director, IR
Brandeis Univ
P O Box 9110
Waltham, MA 02254-9110
617-736-2010
617-736-3485
bpalmer@binah.
cc.brandeis.edu
P

Christopher Peters
Assoc Director
Villanova Univ
800 Lancaster Ave
Villanova, PA 19085-1699
610-519-7322
610-519-7162
peters-c@email.vill.edu
P

Joseph Pettit
VP, Plng/IR
Georgetown Univ
303 McGuire Hall
Washington, DC 20057
202-687-3587
202-687-3935
PETTIT@GUNET.GEORGETOWN.EDU
P

Diane Phillips
Director, IR
Fashion Institute Technology
227 W 27th St
New York, NY 10001
212-760-7178
212-760-7198
F

Sandra J. Price
Director, IR
Keene State College
229 Main Street
Keene, NH 03435-1506
603-358-2117
603-358-2124
SPRICE@KEENE.EDU
P

Richard W. Prull
Director, IR
Rhode Island College
600 Mt. Pleasant Avenue
Providence, RI 02828
401-456-8435
401-456-8209
RPRULL@GROG.RIC.EDU
P

John Pryor
Coord, Eval/Rsch
Dartmouth College
5 Rope Ferry Rd
6143 Hinman
Hanover, NH 03755
603-650-1449
603-650-1839
John.Pryor@dartmouth.edu
P

Brad Quin
Director, Adm & Eval Serv
The College Board
45 Columbus Ave
New York, NY 10023
V

Catherine Regan
Research Associate
SUNY-Central Admin
University Plaza
Albany, NY 12246
518-443-5639
518-443-5632
REGANCE@SYSADM.SUNY.EDU
P

Leslie Reggero
Rsch Assoc
Mt St Mary Coll
330 Powell Ave
Newburgh, NY 12550

914-569-3192
914-562-6762
REGGERO@MSMC.EDU
F

Donald R Rentschler
Sp Asst to Provost
Joint Military
Intelligence College
MC-P
Washington, DC 20340-5100
703-695-9072
lkrn46a@prodigy.com
F

Joseph Revelt
Instl Research Associate
Millersville Univ
PO Box 1002
Millersville, PA 17551-0302
717-871-2390
717-871-2251
JREVELT@MARAUDER.MILLERSV.EDU
M

Stuart L. Rich
Director, IR
Georgetown Univ
Room 303 Maguire Hall
Washington, DC 20057-1099
202-687-3424
202-687-3935
RICH@GUNET.GEORGETOWN.EDU
P

James L. Ritchie
Director, IR
Univ of Pittsburgh
1904 Cathedral of Learning
Pittsburgh, PA 15260
412-624-1220
412-624-1817
JLR@VMS.CIS.PITT.EDU
P

Remington Rose-Rossley
VP, Acad Affairs
Univ of Guam
303 University Dr
Mangilao, GUAM 96923
671-735-2994
671-734-2296
crossley@uog9.uog.edu
F

Lynn Rothstein
Ex Assoc to Pres,
Rsch/Plng
Union Theological Seminary
3041 Broadway
New York, NY 10027
212-280-1421
212-280-1564
lr99@columbia.edu
P

Richard Rugen
Asst to Pres,
Plng/Info Tech
Kutztown Univ
Kutztown, PA 19530
610-683-4153
610-683-4010
RUGEN@KUTZTOWN.EDU
P

Kathy A. Russavage
Director, IR
Saint Peter's College
Room 208
2461 Kennedy Blvd
Jersey City, NJ 07306
201-915-9079
201-451-0036
RUSSAVAGE@SPCVXA.SPC.EDU
M

Barbara R. Sadowski
Director, Plng/IR
Marywood College
2300 Adams Ave
Scranton, PA 18509
717-348-6203
717-348-1899
SADOWSKI@AC.MARYWOOD.EDU
M

Mary Frances Schlichter
Dept Administrator
Columbia Univ
211 Low Memorial Library
New York, NY 10027
212-854-2489
212-854-9493
mfs20@columbia.edu
F

Helen Schneider
Director, Rsch/Analysis
MD Ind Coll&Univ Assoc
60 W Street, Suite 201
Annapolis, MD 21401
410-269-0306
410-269-5905
schneider@loyolanet.
campus.mci.net
P

Charles Secolsky
Research Associate
Rockland Comm Coll
145 College Rd
Suffern, NY 10901
914-574-4485
914-574-4425
csecolsky@srccva.dp.sunyrockland.edu
P

David G. Seguin
Assoc Dean, Acad Affairs
Jamestown Comm Coll
525 Falconer St
Jamestown, NY 14710
716-665-5220 X445
716-665-3498
SEGUINDG@JCCW22.
CC.SUNYJCC.EDU
M

Sr. Mary George Senderak
Director, IR
College of Saint Elizabeth
2 Convent Road
Morristown, NJ 07960-6989
201-605-7430
201-605-7070
SMGEORGE@LIZA.ST-ELIZABETH.EDU
P

Catherine Serianni
Director, IR
Niagara Univ
Niagara Univ, NY 14109
716-286-8571
716-286-8422
CS@NIAGARA.EDU
M

Tricia Shimkus
Director, IR
Lehigh Carbon CC
4525 Education Park Dr
Schnecksville, PA 18078
610-799-1592
610-799-1187
M

Elizabeth Sibolski
Director, Plng/IR
American Univ
Leonard LL
4400 Mass Ave, NW
Washington, DC 20016-8059
202-885-6154
202-885-3278
BSIBOLS@AMERICAN.EDU
P

Ed Silverman
Director, IR
City College of New York
160 Convent Ave
New York, NY 10031
212-650-6480
212-650-6425
OIRTRAN@CCNY.CUNY.EDU
P

Daniel Silvia
Research Analyst
Boston Univ
881 Commonwealth
Boston, MA 02215
617-353-4135
dsilvia@bu.edu
F

Lucyann Skvarla
Assistant for IR
King's College
133 N River St
Wilkes-Barre, PA 18711-0801
717-826-5886
717-825-9049
lmskvarl@gw02.kings.edu
M

Kent Smith
Director, IR
Trinity College
300 Summit St
Hartford, CT 06106-3100
860-297-5195
860-297-2251
KENT.SMITH@TRINCOLL.EDU
F

Lydia S. Snover
Senior Plng Officer/IR
MIT
77 Massachusettts Ave
Room 12-192
Cambridge, MA 02139
617-253-5838
617-253-1986
LSNOVER@MIT.EDU
P

Paul Snyder
Director, IR/Plng
Rutgers,
State State Univ of NJ
IR & Academic Plng
Geology Hall
New Brunswick, NJ 08903
903-932-8550
908-932-1268
SNYDER@INSTLRES.
RUTGERS.EDU
F

Holly Staatse
Sr Rsch Assoc
Mercer Co Comm Coll
1200 Old Trenton Road
P.O. Box B
Trenton, NJ 08690
609-586-4800 X457
609-586-2318
P

James A. Stager
Assoc Provost-Ac Admin
Millersville Univ
PO Box 1002
Millersville, PA 17551
717-872-3599
717-871-2251
JSTAGER@MARAUDER.
MILLERSV.EDU
P

Ann Marie Stamford
Assessemtn Coordinator
Univ of Scranton
Office of Assess & IR
Alumni Memorial Hall 126
Scranton, PA 18510-4629
717-941-4178
717-941-7899
STAMFORDA1@UOFS.EDU
P

Karen Stout
VP, Instl Adv
Camden Co Coll
PO Box 200
Blackwood, NJ 08012
609-374-4931
609-374-4892
KASTOUT@PILOT.NJIN.NET
M

William S. Stuart
Research Analyst
Eastern CT State Univ
83 Windham St
Willimantic, CT 06226
680-465-4482
680-465-4485
stuartw@ecsuc.ctstateu.edu
P

Alan J. Sturtz
Director, IR/Plng/Dev
Gateway Comm-Tech College
60 Sargent Drive
New Haven, CT 06511
203-789-7030
203-789-6466
sturtz@commnet.edu
P

Catherine Svetec
Director, IR
Haverford College
370 Lancaster Ave
Haverford, PA 19041
610-896-1221
610-896-1224
CSVETEC@HAVERFORD.EDU
M

Eleanor Swanson
Director, IR
Monmouth College
Cedar Ave
West Long Branch, NJ
07764-1898
908-571-7529
908-623-5142
ESWANSON@MONDEC.
MONMOUTH.EDU
P

Peter Syverson
VP, Rsch & Info Serv
Council of Grad Schools
One Dupont Circle, NW
Suite 430
Washington, DC 20036-1173
202-223-3791
202-331-7157
psyverson@cgs.nche.edu
F

Bruce Szelest
Assoc for IR
SUNY-Albany
Administration 241
1400 Washington Ave
Albany, NY 12222
518-442-5411
518-442-5418
bps23@poppa.fab.albany.edu
P

Fred Takacs
IR Specialist
Burlington Co Coll
County Rt 530
Pemberton, NJ 08068
609-894-9311 x7357
609-726-1780
ftakacs@pemb.bcc.edu
F

Toni Taylor
Asst Director, IR .
Univ of New Hampshire
Palmer House
20 Rosemary Ln
Durham, NH 03824-3537
603-862-2410
603-862-3853
t_taylor@unhn.unh.edu
P

Dawn G. Terkla
Director, IR
Tufts Univ
28 Sawyer Avenue
Medford, MA 02155
617-627-3274
617-627-3993
DTERKLA@INFONET.TUFTS.EDU
P

Barbara Thelen
Asst for IR
Rockland Comm Coll
145 College Rd
Suffern, NY 10901
914-574-4585
914-574-4425
BTHELEN@SNYRCCVA.
DB.SUNYROCKLAND.ED
U
P

Emily Thomas
Director, Plng/IR
SUNY, Stony Brook
310 Administration
Stony Brook, NY 11794-0701
516-632-6265
516-632-6621
emily.thomas@sunysb.edu
F

Stephen Thorpe
Director, IR
La Salle Univ
1900 W Olney Ave
Philadelphia, PA 19141
215-951-1428
215-951-1783
THORPE@LASALLE.EDU
P

Robert K Toutkoushian
Executive Director
Univ System of New Hampshire
Office of Policy Analysis
Myers Center, 27 Concord Rd
Durham, NH 03824
603-868-1800 X166
603-868-2756
r_toutkoush@usnh.unh.edu
F

James F. Trainer
Director, HEDS
HEDS Consortium
Franklin Marshall College
PO Box 3003
Lancaster, PA 17604-3003
717-399-4448
717-399-4456
J_TRAINER@ACAD.FANDM.EDU
P

Cenk Tureli
Research Asst
Providence College
Providence, RI 02918
401-865-2724
401-865-2236
tureli@providence.edu
F

Philip VanBlarcom
Research Assoc
Bergen CC
Room A306
400 Paramus Rd
Paramus, NJ 07652-1595
201-447-7209
201-445-8532
philv@email.njin.net
F

J. Fredericks Volkwein
Director, IR
SUNY-Albany
Administration 241
1400 Washington Ave
Albany, NY 12222
518-442-5413
518-442-5418
VOLKWEIN@ALBANY.EDU
P

Anita Voogt
Assoc Dean, Acad Affairs
Dutchess CC
53 Pendell Rd
Poughkeepsie, NY 12601
914-431-8966
914-431-8993
voogt@sunydutchess.edu
F

Tim Walsh
Director, Student Info
Temple Univ
1801 N Broad St
Philadelphia, PA 19122-1803
215-204-5050
215-204-3756
WALSH@VM.TEMPLE.EDU
P

Mary Jean Whitelaw
Director, Survey Rsch
The Carnegie Foundation
5 Ivy Lane
Princeton, NJ 08502
609-452-1780
609-520-1712
mjw@carnegiefoundation.org
P

Patricia M. Williams
Senior Rsch Assoc
Colgate Univ
13 Oak Drive
Hamilton, NY 13346-1398
315-824-7714
315-824-7861
PWILLIAMS@CENTER.COLGATE.EDU
P

Linda E. Winkler
Director, IR/Plng
Mount Saint Mary's College
16300 Old Emmitsburg Rd
Emmitsburg, MD 21727
301-447-5306
301-447-5755
WINKLER@MSMARY.EDU
P

Marjorie E. Wiseman
Director, IR
Northeastern Univ
401 Churchill Hall
Boston, MA 02115
617-373-5100
617-373-5106
MWISEMAN@NEU.EDU
P

Carol W. Wood
Asst to Dean, IR/Plng
Alfred Univ
2 Pine St
Alfred, NY 14802
607-871-2243
607-871-2344
WOOD@BIGVAX.ALFRED.EDU
P

Charlotte Woodward
Data Coordinator/Analyst
Marywood College
2300 Adams Avenue
Scranton, PA 18509
717-348-6203
717-348-1899
woodward@ac.marywood.edu
P

Carol L. Wurster
Director, IR/Plng
SUNY College-Old Westbury
Box 210
Old Westbury,NY 11568-2210
516-876-2715
516-876-3209
WURSTERC@SOLDUX.
OLDWESTBURY.EDU
M

Robert A. Yanckello
Asst Director, Plng/IR
Central CT State Univ
Davidson Hall 104
1615 Stanley Street
New Britain, CT 06050
203-832-1782
203-823-1781
yanckello@ccsu.ctstateu.edu
P

Jane Zeff
Associate Director
William Paterson College
358 Hamburg Tpke
PO Box 913
Wayne, NJ 07470-0913
201-595-3115
201-595-3598
zeffj@gw.wilpaterson.edu
P

Jishen Zhao
Statistician/Analyst, IR
The College of Saint Rose
432 Western Ave
Albany, NY 12203
518-458-5383
518-438-3293
ZHAOJ@ROSNET.STROSE.EDU
P

Christine Zimmerman
Director, IR
St. Lawrence Univ
Vilas 209
Canton, NY 13617-1455
315-379-5394
315-379-5435
CZIM@MUSIC.STLAWU.EDU
P

M = Member (but did not attend conference)
P = Conference Attendee
F = First-time Conference Attendee
V = Vendor

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